

**HAWTHORN PARK LANDFILL
APPENDIX III-4B**

Boring Plan Approval Letters..... III-4B-1 and III-4B-2
Boring and Well Location Map..... III-4B-3
Logs of Borings, Piezometers, and Monitoring Wells..... III-4B-4 through III-4B-308

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 16, 2019

Mr. Charles A. Rivette, P.E.
Director, Planning and Project Development
USA Waste of Texas Landfills, Inc.
9821 Katy Freeway, Suite 700
Houston, Texas 77024

Re: Hawthorn Park Landfill - Harris County
Municipal Solid Waste (MSW) - Permit No. 2185
Proposed Site Investigation - Revised Soil Boring Plan
Tracking Nos. 23572693, 23646388; RN102664232/CN602560930

Dear Mr. Rivette:

On November 20, 2018, we received a soil boring plan (SBP) for a proposed expansion of the referenced MSW Type IV landfill facility. On December 21, 2018, we received revisions to the SBP in response to our letter dated December 18, 2018. The original SBP and revisions were submitted on your behalf by Elizabeth Floyd, P.G., of Biggs & Mathews Environmental. Our review of the plan indicates that it complies with the MSW regulations. This letter constitutes approval of your plan.

The SBP proposes 11 new borings, along with 14 previously drilled borings, to characterize expansion areas totaling approximately 50 acres. All 11 new borings will be drilled to an elevation at least 30 feet below the elevation of deepest excavation (EDE, 40 feet above sea level). Of the 14 previously drilled borings, 13 were drilled to an elevation at least 30 feet below the EDE.

Please be advised that under Title 30 Texas Administrative Code §330.63(e)(4)(B), the uppermost aquifer and any hydraulically interconnected aquifers below the site must be identified, as well as the underlying confining unit. It is anticipated that this SBP, when implemented, will accurately characterize the in-situ geologic, hydrologic, and engineering properties of the surface and subsurface strata at this site. Although this plan appears to comply with the MSW regulations concerning site investigations, additional soil borings and piezometers could be required should the data generated by this SBP prove to be inconclusive.

If you should find it necessary to modify this approved plan, another plan detailing any proposed modifications must be submitted for approval before implementation of the modifications.

If you have questions regarding this letter, please contact me by telephone at (512) 239-3270, or in writing at the address on our letterhead (please include mail code MC 124 on the first line of our address).

Sincerely,

A handwritten signature in cursive script that reads "Sarah Welborn".

Sarah Welborn, P.G.
Municipal Solid Waste Permits Section
Waste Permits Division

SW/arm

cc: Ms. Elizabeth Floyd, P.G., Biggs & Mathews Environmental, Mansfield

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

March 1, 2019

Mr. Charles A. Rivette, P.E.
Director, Planning and Project Development
USA Waste of Texas Landfills, Inc.
9821 Katy Freeway, Suite 700
Houston, Texas 77024

Re: Hawthorn Park Landfill - Harris County
Municipal Solid Waste (MSW) - Permit No. 2185
Proposed Site Investigation - Modified Soil Boring Plan
Tracking No. 24040005; RN102664232/CN602560930

Dear Mr. Rivette:

On February 15, 2019, we received a proposed modification to the original soil boring plan (SBP) approved in a letter dated January 16, 2019, for a proposed expansion of the referenced MSW Type I landfill facility. The modified SBP was submitted on your behalf by Elizabeth Floyd, P.G., of Biggs & Mathews Environmental.

It was determined that drilling cannot be accomplished at the original proposed location for BME-10. The modified SBP proposes two alternate locations, BME-10A or BME-10B. The new boring will be drilled at least 30 feet below the elevation of deepest excavation (40 feet above sea level). Our review of the plan indicates that it complies with the MSW regulations. This letter constitutes approval of the modified plan.

Please be advised that under Title 30 Texas Administrative Code §330.63(e)(4)(B), the uppermost aquifer and any hydraulically interconnected aquifers below the site must be identified, as well as the underlying confining unit. Although this plan appears to comply with the MSW regulations concerning site investigations, additional soil borings and piezometers could be required should the data generated by this SBP prove to be inconclusive.

If you should find it necessary to modify this approved plan, another plan detailing any proposed modifications must be submitted for approval before implementation of the modifications.

If you have questions regarding this letter, please contact me by telephone at (512) 239-3270, or in writing at the address on our letterhead (please include mail code MC 124 on the first line of our address).

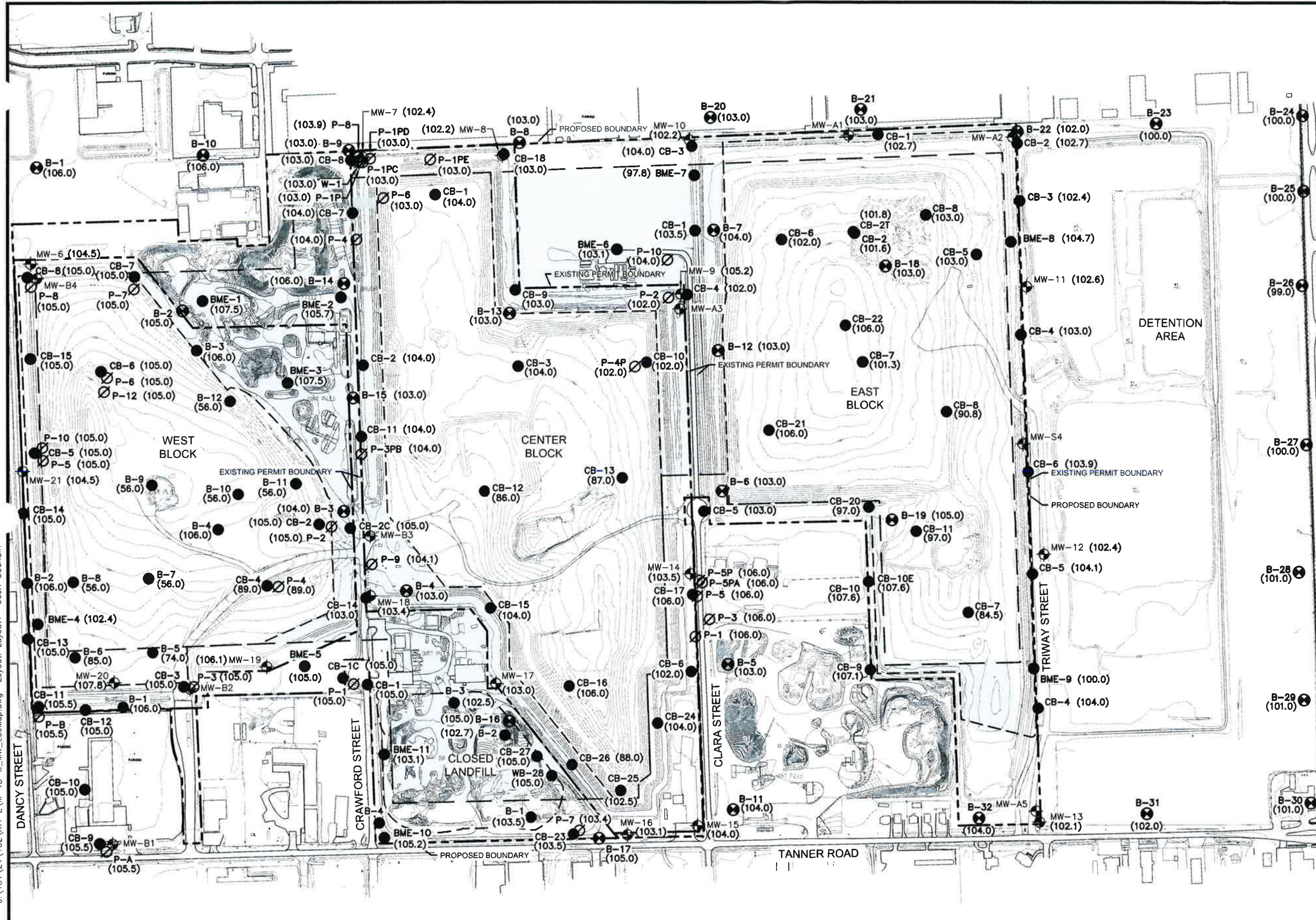
Sincerely,

A handwritten signature in cursive script that reads "Sarah Welborn".

Sarah Welborn, P.G.
Municipal Solid Waste Permits Section
Waste Permits Division

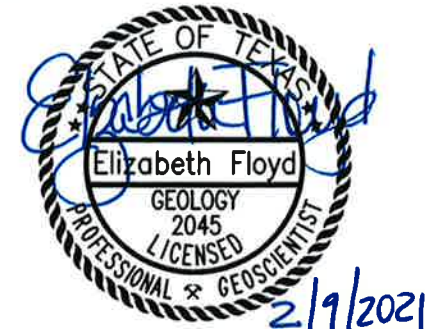
cc: Ms. Elizabeth Floyd, P.G., Biggs & Mathews Environmental, Mansfield

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- LEGEND**
- CURRENT PERMIT BOUNDARY
 - PROPOSED PERMIT BOUNDARY
 - CURRENT LIMIT OF WASTE
 - PROPOSED LIMIT OF WASTE
 - CB-8 SOIL BORING
 - ⊙ P-5 PIEZOMETER
 - ⊕ MW-8 MONITORING WELL
 - ⊗ B-1 GEOPHYSICAL BORING
 - WASTE FOOTPRINT EXPANSION AREA (50 ACRES)
 - (101.3) SURFACE ELEVATION

- NOTES:**
1. EXISTING TOPOGRAPHIC MAP AND BORING LOCATIONS PROVIDED BY GOLDER ASSOCIATES.
 2. LOCATIONS FOR BORINGS CB-1 THROUGH CB-8 DRILLED IN 1980 BY MCBRIDE-RATCLIFF AND ASSOCIATES, INC. WERE TAKEN FROM FIGURE 1 - PLAN OF BORINGS TAKEN FROM THE MSW-1448 PERMIT DOCUMENT.
 3. LOCATIONS OF BORINGS B-1 THROUGH B-4 WERE TAKEN FROM PAGE A-1 BORING PLAN FROM THE 1977 SOUTHWESTERN LABORATORIES-SUBSURFACE INVESTIGATIONS REPORT.



BORING AND MONITORING WELL LOCATIONS

USA WASTE OF TEXAS LANDFILLS, INC.
HAWTHORN PARK LANDFILL
PERMIT AMENDMENT


BIGGS & MATHEWS
 ENVIRONMENTAL
 CONSULTING ENGINEERS
 MANSFIELD
 DALLAS • WICHITA FALLS
 817-563-1144

ISSUED FOR PERMITTING PURPOSES ONLY

REVISIONS		TBPE FIRM NO. F-256	TBPG FIRM NO. 50222
REV	DATE	DESCRIPTION	DWN BY DES BY CHK BY APP BY

III-4B-3

**BIGGS AND MATHEWS ENVIRONMENTAL
2019**

LOG OF BORING NO. BME-1

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 76063
Phone: 817-563-1144

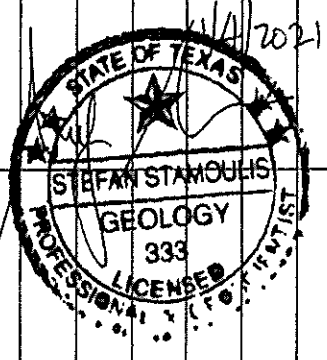
**Project Description: Hawthorn Park
Hawthorn Park Landfill**

Location: E 3090557.000 N 751525.900

Surface El.: 107.00 ft. msl
Completion Depth: 100.0 ft.
Date Boring Started: 2/15/2019
Date Boring Completed: 2/18/2019

MATERIAL DESCRIPTION

Depth, feet	Samples	Symbol / USCS	Material Description	Hand Penetrometer, lsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, lsf
0			Fill (CL)	4.5								
5	U1 NR A2 NR			99.00								
10	U3 U4 U5 U6 U7 U8 U9 U10 U11 U12		Clay, silty, light gray, with ferrous stains, with calcareous nodules, hard (CL) - light gray and light brown, hard - with abundant calcareous material - with sand	4.0 4.5 4.5+ 4.5 4.5+ 4.5+ 4.5+ 4.5+ 4.5+ 4.5+								
25				79.00								
30	U13 S14 S15 S16 S17 S18 S19		Sand, clayey, tan and light brown, with gray, unconsolidated, very firm, moderately dense (SC) - with calcareous nodules, dense	2.0 6/7/13 50-4" 50-3" 50-3 1/2" 10/50-5" 50-4"							46.1	
45	S20 S21 S22 S23		Sand, with silt, light reddish brown and tan, dense, with slightly cemented zones (SP-SM)	65.00 45/50-1" 43/46/50-1" 49/50-2" 48/50-2"								



BME LOG HAWTHORN PARK.GPJ B3M DATA TEMPLATE.GDT 12/29/20

Contractor: HET
Method: HSA & Wet Rotary
Sampling Method: Split Spoon & Shelby Tube
Geologist/Engineer: S. Stamoulis
Project No.: 101.24.102

Groundwater Observations	
Date	Depth

Remarks: Borehole grouted upon completion.



The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

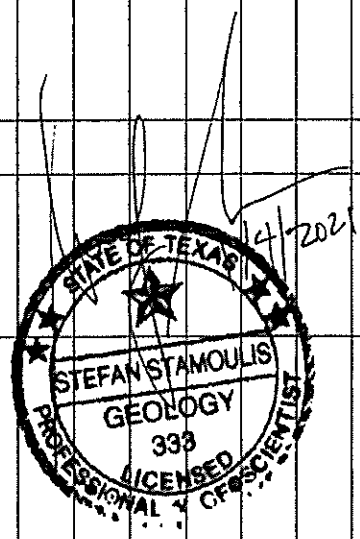
Continued Next Page

LOG OF BORING NO. BME-1

Biggs and Mathews Environmental
 1700 Robert Road, Suite 100
 Mansfield, Texas 75063
 Phone: 817-583-1144

**Project Description: Hawthorn Park
 Hawthorn Park Landfill**

Depth, feet	Samples	Symbol / USCS	Location: E 3090557.000 N 751525.900	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf	
			Surface El.: 107.00 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/15/2019 Date Boring Completed: 2/18/2019										
MATERIAL DESCRIPTION													
55	S24		Sand, with silt, light reddish brown and tan, dense, with slightly cemented zones (SP-SM) <i>(continued)</i> - with trace clay pockets - tan, unconsolidated, very fine-grained to fine-grained, dense	50-5'									
	S25				40/39/45								
	S26				10/50-2'								
	S27				50-5'								
	S28				50-4 1/2'								
60	S29		Sand, with clay, dark reddish brown, dense (SC)	47.00									
	S30				34/25/18								
	S31				30/31/30								
65	U32		Clay, silty, reddish brown and gray, stiff (CL)	41.00									
	S33				23/30/30								
70	U34		Clay, reddish brown, hard (CL) - gray and light brown, trace silt, hard	37.00									
	U35				10/40/48								
	U36				4.5+								
	U37				4.5+		15.8		31	13	18	52.3	
	U38				4.0								
	U39				4.0								
	U40				4.5								
	U41				4.0								
85	S42		Clay, silty, with sand seams, light reddish brown (CL)	23.00									
	S43				1.76								
	S44				50-5'								
	U45				50/5/50-2'								
90	S45		Sand, silty, reddish brown, unconsolidated, very firm to firm, dense (SP-SM) - brown to light reddish brown - with clay pockets, with calcareous nodules, dense	15.00									
	S46				35/40/50-2'								
95	U46		Clay, reddish brown, hard (CH)	7.00									
	U47				4.5+								
	S48				4.5+								



BME LOG HAWTHORN PARK.GPJ BSM DATA TEMPLATE.GDT 12/23/20

Contractor: HET Method: HSA & Wet Rotary Sampling Method: Split Spoon & Shelby Tube Geologist/Engineer: S. Stamoulis Project No.: 101.24.102	Groundwater Observations Date: _____ Depth: _____ Tube: _____	Remarks: Borehole grouted upon completion.
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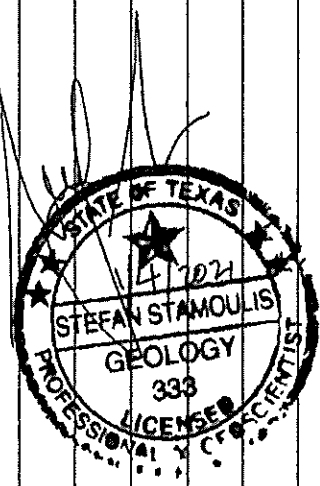
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
 LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-2

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 76063
Phone: 817-563-1144

**Project Description: Hawthorn Park
Hawthorn Park Landfill**

Depth, feet	Samples	Symbol / USCS	Location: E 3091110.000 N 751539.600	Hand Penetrometer, lsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, lsf
Surface El.: 107.50 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/20/2019 Date Boring Completed: 2/21/2019												
MATERIAL DESCRIPTION												
	A1		Clay, gray and dark gray, with rootlets, firm (CL)	105.50	1.5							
	U2		Clay, silty, gray and brown, with ferrous stains, abundant calcareous nodules, hard (CH)		3.0							
5	U3			4.5								
	U4			4.5								
	U5			4.5								
10	U6			4.5								
	U7		- gray and light reddish brown, with calcareous nodules, with ferrous stains, hard	93.50	4.0	20.7		55	16	39	78.6	
15	U8		Clay, sandy, gray with ferrous stains, with silt partings (CH)		4.5							
	U9				4.5							
	U10		- with trace calcareous material		4.5							
20	U11		- very sandy, greenish gray, with sand seams	85.50	1.0							26.1
	S12		Sand, silty, greenish gray, dense (SM)		5/13/20							
25	S13			81.50	10/50-5							
	S14		Sand, with silt, with trace clay, reddish brown, unconsolidated, very fine-grained, dense (SW-SM)		35/50/4							
	S15				10/50-1							
30	S16		- tan, with trace calcareous nodules, unconsolidated, very fine-grained, hard		45/50-1							
	S17				10/50-2							
35	S18				50-2'							
	S19				50/41'							
	S20		- brown and light reddish brown, dense		10/38/24							
40	S21		- light brown, trace silt		38/43/40							
	S22				40/40/50-2'							
45	S23				10/50-5'							
	S24				38/50-2'							
50	S25			57.50								



BME LOG HAWTHORN PARK.GPJ BSM DATA TEMPLATE.GDT 12/23/20

Contractor: **HET**
 Method: **HSA & Wet Rotary**
 Sampling Method: **Split Spoon & Shelby Tube**
 Geologist/Engineer: **S. Stamoulis**
 Project No.: **101.24.102**

Groundwater Observations	
Date	Depth

Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and Shelby tubes.



The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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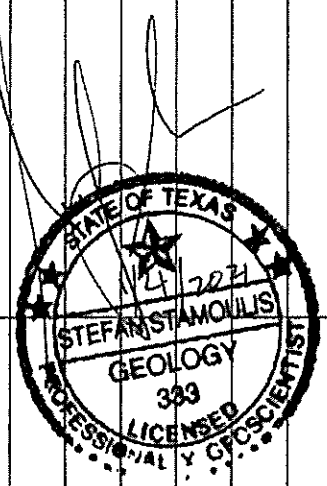
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LOG OF BORING NO. BME-2

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 76063
Phone: 817-563-1144

Project Description: **Hawthorn Park**
Hawthorn Park Landfill

Depth, feet	Samples	Symbol / USCS	Location: E 3091110.000 N 751539.600	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf	
			Surface Elevation: 107.50 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/20/2019 Date Boring Completed: 2/21/2019										
MATERIAL DESCRIPTION													
	S26	•••••	Sand, light brown, unconsolidated, very fine-grained, dense (SW)	50.5'									
	S27			50.4'									
55	S28			45/50-11	51.50								
	S29	▨▨▨▨▨	Clay, with sand, reddish brown, very hard, with silt partings (CH)	50.5'									
	S30			39/50-2									
60	U31			4.0	- hard	24.3	69	23	46	66.9			
	U32			4.0	- with trace ferrous stains								
65	U33			4.5	- with silt and clayey silt seams								
	U34			4.0	- greenish gray, with trace silt and ferrous stains, hard								
	U35			4.0	- greenish gray and light reddish brown, with trace ferrous stains, hard								
70	U36			4.5									
	U37			4.5									
75	U38			4.5+		32.50							
	U39		Clay, silty, light gray and reddish brown, with ferrous stains, with silt partings (CH)	4.5+									
	S40			20/50-5'									
80	S41			4.5+									
	S42			4.5+									
85	S43			4.0									
	S44			4.5									
	S45			4.5									
90	U46		Clay, reddish brown, hard to very hard (CH)	4.5+									
	U47			4.5+									
95	U48			4.5+									
	U49			4.6+									
	S50			4.5+									
100				7.50									



BME LOG HAWTHORN PARK.GPJ B3M DATA TEMPLATE.GDT 12/23/20

Contractor: HET	Groundwater Observations	Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and Shelby tubes.
Method: HSA & Wet Rotary	Date	
Sampling Method: Split Spoon & Shelby Tube	Depth	
Geologist/Engineer: S. Stamoulis		
Project No.: 101.24.102		



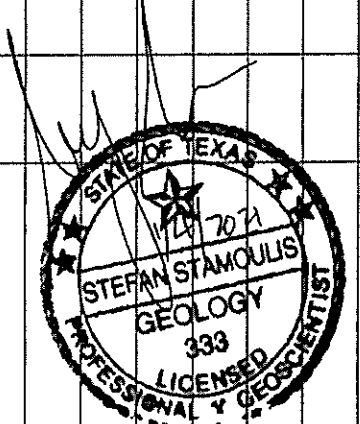
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LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-3

Biggs and Mathews Environmental
 1700 Robert Road, Suite 100
 Mansfield, Texas 76063
 Phone: 817-563-1144

Project Description: **Hawthorn Park**
Hawthorn Park Landfill

Depth, feet	Samples	Symbol / USCS	Location: E 3090898.000 N 751193.600	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf	MATERIAL DESCRIPTION		
													Surface El.: 107.50 ft. msl	Completion Depth: 100.0 ft.	
	A1		Fill (CL)												
	A2														
5	A3														
	A4			99.50											
	U5		Clay, dark gray with calcareous nodules, hard (CL)	97.50	4.5+										
10	U6		Clay, silty, gray and brown, with ferrous stains (CL)		3.0										
	U7				2.0										
	U8		Clay, gray and brown, with ferrous stains (CH)	93.50	2.0										
15	U9		- with calcareous nodules		3.0										
	U10				4.0										
20	U11		Clay, silty with sand, greenish gray, with sand partings, stiff (CL)	87.50	2.5										
	U12				2.5	17.0	112.9	33	12	21	64				
	U13				4.5+										
25	NR13		- with calcareous nodules												
	U14														
	S15			77.50											
30	S16		Sand, silty, reddish brown, unconsolidated, very fine-grained, dense (SM)		50-5"										
	S17			73.50											
35	S18		Sand, tan, very fine-grained, unconsolidated, dense, with slightly cemented zones (SW)		50-3 1/2"										
	S19		- tan to light brown, with clay		50-4"										
40	S20				49-50-1"										
	S21				50-5"										
	S22			63.50											
45	S23		Sand, silty, tan, with trace clay (SM)		50-4 1/2"										
	S24		- tan and light reddish brown, with clay pockets		40-33/16"								21.4		
	S25		- fine-grained to very fine-grained, dense		35-37/16"										
50															



BME LOG HAWTHORN PARK.GPJ B3M DATA TEMPLATE.GDT 12/29/23

Contractor: **HET**
 Method: **HSA & Wet Rotary**
 Sampling Method: **Split Spoon & Shelby Tube**
 Geologist/Engineer: **S. Stamoulis**
 Project No.: **101.24.102**

Groundwater Observations	
Date	Depth

Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and shelly tubes.



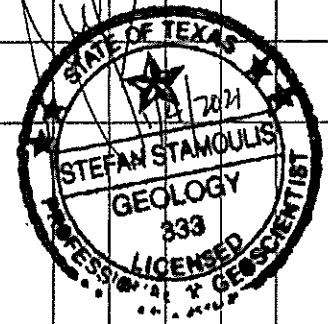
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LOG OF BORING NO. BME-3

**Project Description: Hawthorn Park
Hawthorn Park Landfill**

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Manefield, Texas 78063
Phone: 817-563-1144

Depth, feet	Samples	Symbol / USCS	Location: E 3090898.000 N 751193.600	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Surface El.: 107.50 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/20/2019 Date Boring Completed: 2/22/2019									
MATERIAL DESCRIPTION												
55	S26		Sand, silty, tan, with trace clay (SM) <i>(continued)</i>	23/30/3								
	S27			35/50/4								
	S28			35/39/50								
	S29		- with calcareous nodules, with cemented sand seams	50-5 1/2"								
	S30			24/35/33								
	S31			50-5"								
	S32			50-4"								
	S33		Sand, trace silty, light reddish brown (SM)	43.50								
	S34		- with clay pockets	50-5 1/2"								
	U35		Clay, reddish brown, hard (CL)	39.40/4								
	U36		Clay, silty, light reddish brown, with ferrous stains (CL)	30								
	U37		- silty, light reddish brown, with ferrous stains	37.50								
	NR			3.5		13.3		44	16	28	90.9	
	U39			4.5+								
	U40		Clay, silty, light reddish brown and gray, with ferrous stains (CL)	4.5+								
	U41		Clay, reddish brown, with silt partings, hard (CH)	2.0								
	U42			29.50								
	U43		Silt, sandy, reddish brown (ML)	2.0								
	U44		Clay, reddish brown, hard, with trace silt partings (CL)	27.50								
	U45			4.5+								
	U46			4.5+								
	U47			23.50								
	U48			1.0								
	S49		Clay, reddish brown, hard (CH)	1.0								
	S50			20.50								
				3.5								
				4.0								
				11.50								
				4.5+								
				4.5+								
				7.50								



BME LOG HAWTHORN PARK.GPJ B&M DATA TEMPLATE.GDT 12/29/20

Contractor: HET	Groundwater Observations	Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and shelly tubes.	
Method: HSA & Wet Rotary	Date		
Sampling Method: Split Spoon & Shelby Tube	Depth		
Geologist/Engineer: S. Stamoulis			
Project No.: 101.24.102			

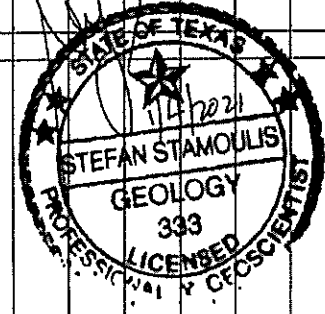
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-4

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Manefield, Texas 75063
Phone: 817-563-1144

**Project Description: Hawthorn Park
Hawthorn Park Landfill**

Depth, feet	Samples	Symbol / USCS	Location: E 3089895.000 N 750230.400	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
Surface El.: 102.40 ft. msl												
Completion Depth: 101.0 ft.												
Date Boring Started: 2/13/2019												
Date Boring Completed: 2/15/2019												
MATERIAL DESCRIPTION												
	A1		Fill (CL)		3.5							
	U2				4.0							
5	U3				2.0							
	U4				2.0							
	U5				1.75							
10	U6				1.75	21.8		36	18	23	73	
	U7				1.75							
	U7				1/3/6							
15	S8				1/8/9							
	S9				84.40							
	NR		Clay, gray and red, with ferrous stains, hard (CL)		3.0							
					82.40							
20	U11		Clay, sandy, gray and tan, with ferrous stains, hard (CL)		3.5							
	U12				3.0							
					6/9/10							
25	S13		Sand, silty, with clay, light gray, unconsolidated, very fine-grained to fine-grained (SM)		77.40							
	S14				74.40							
	S15		Sand, with silt, tan and light gray, unconsolidated, fine-grained, firm (SP-SM)		3/3/5						11.3	
30	S16				4/7/9							
	S16				70.40							
	S17		Clay, silty, red and tan, with ferrous stains, hard (CL)		2/4/8							
					3/4/9							
35	S18				4.5+	20.7		17	27	91.4		
	U19				4.5+							
	U20				63.40							
40	U20		Clay, red and tan, with ferrous stains, hard (CH)		62.40							
	U21		Clay, silty, red and tan, with ferrous stains, hard (CL)		4.5+							
	U22				4.5+							
	U23				4.5+							
	U24				4.5+							
	U25				4.5+							
50												



BME LOG HAWTHORN PARK GP1 B&M DATA TEMPLATE.GDT 12/29/20

Contractor: **HET**
 Method: **HSA & Wet Rotary**
 Sampling Method: **Split Spoon & Shelby Tube**
 Geologist/Engineer: **S. Stamoulis**
 Project No.: **101.24.102**

Groundwater Observations	
Date	Depth

Remarks: Borehole grouted upon completion. Wet rotary rig, splittspoons, and shelly tubes.



Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

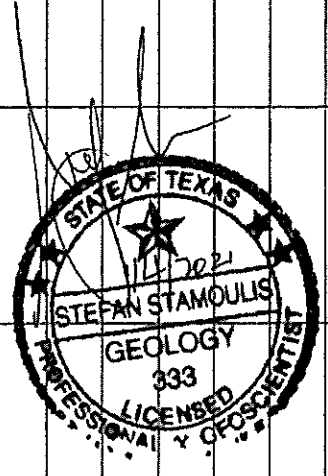
LOG OF BORING NO. BME-4

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Manfield, Texas 78063
Phone: 817-563-1144

**Project Description: Hawthorn Park
Hawthorn Park Landfill**

Depth, feet	Samples	Symbol / USCS	Location: E 3089895.000 N 750230.400	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf	
			Surface El.: 102.40 ft. msl Completion Depth: 101.0 ft. Date Boring Started: 2/13/2019 Date Boring Completed: 2/15/2019										
MATERIAL DESCRIPTION													
55	U26	CL	Clay, silty, red and tan, with ferrous stains, hard (CL) <i>(continued)</i>	4.5+									
	U27			4.5									
	U28			4.5									
	S29			50/3*									
	S30			19/35/2*									
60	S31	CL	Clay, with sand, brown to reddish brown, very fine-grained, hard (CL)	42.40	19/29/2*								
	S32			4.0									
65	U33	CH	Clay, brown to reddish brown, hard (CH)	38.40	4.5+	26.7	69	24	45	99.0			
	U34			4.5+									
70	U35	CL	Clay, with sand, brown to reddish brown, very fine-grained, hard (CL)	34.40	4.5+								
	U36			4.5+									
	U37			4.5+									
75	U38			4.5+									
	U39			2.0									
	U40			2.0									
	U41			2.0									
80	U42			18.40	13/30/4*								
85	S43	ML	Silt, sandy, with clay, with clay seams, reddish brown, unconsolidated, very fine-grained, dense (ML)	15/40/4*									
	S44			1.0									
	U45			.75									
90	U46			10.40	4.5+								
95	U47	CL	Clay, silty, with clay seams, with silt partings, reddish brown, hard (CL)	4.5+									
	U48			4.5+									
	U49			4.5+									
	U50			4.5+									
100				2.40									

BME LOG HAWTHORN PARK.GPJ BSM DATA TEMPLATE.GDT 12/29/20



Contractor: HET	Groundwater Observations	Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and Shelby tubes.
Method: HSA & Wet Rotary	Date	
Sampling Method: Split Spoon & Shelby Tube	Depth	
Geologist/Engineer: S. Stamoulis		
Project No.: 101.24.102		



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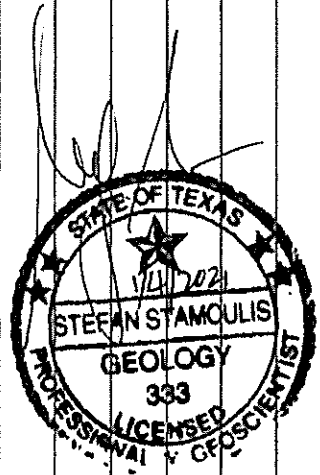
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-4

Biggs and Mathews Environmental
 1700 Robert Road, Suite 100
 Mansfield, Texas 76063
 Phone: 817-563-1144

**Project Description: Hawthorn Park
 Hawthorn Park Landfill**

Depth, feet	Samples	Symbol / USCS	Location: E 3089895.000 N 750230.400	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Surface El.: 102.40 ft. msl Completion Depth: 101.0 ft. Date Boring Started: 2/13/2019 Date Boring Completed: 2/15/2019 MATERIAL DESCRIPTION									
	U51		Clay, silty, reddish brown, with silt partings, hard (CL)	1.40	4.8+							
-105												
-110												
-115												
-120												
-125												
-130												
-135												
-140												
-145												
-150												



BME LOG HAWTHORN PARK.GPJ BSM DATA TEMPLATE.GDT 12/29/20

Contractor: HET Method: HSA & Wet Rotary Sampling Method: Split Spoon & Shelby Tube Geologist/Engineer: S. Stamoullis Project No.: 101.24.102	Groundwater Observations Date: _____ Depth: _____	Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and shelly tubes.	
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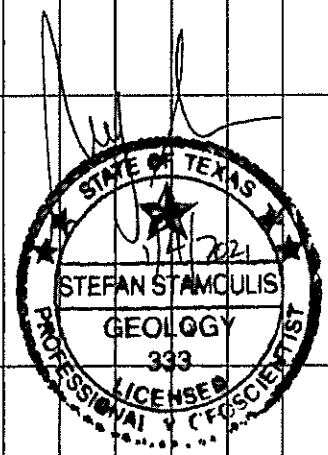
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
 LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-5

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 75063
Phone: 817-563-1144

Project Description: Hawthorn Park
Hawthorn Park Landfill

Depth, feet	Samples	Symbol / USCS	Location: E 3090867.000 N 750058.100	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Surface El.: 105.00 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/11/2019 Date Boring Completed: 2/12/2019									
MATERIAL DESCRIPTION												
	A1		Clay, silty dark brown, stiff, with rootlets (CL)	102.50	1.75							
	U2		Clay, silty, light gray with brown, stiff (CL)		1.5							
5	U3			69.00								
	U4		Sand, clayey, dark gray, with silt, hard (SC)		4.5+	12.7		28	13	15	41	
	U5				4.5+							
10	U6		Sand, clayey, tan to light brown, unconsolidated with ferrous stains (SC)	95.00	1.0							
	S7		Clay, sandy, light brown and tan, firm, with ferrous stains (CL)	93.00								
	S8				4.7/5							
15	S9				5.8/10							
	S9			87.00	4.7/7							
	S10		Sand, silty, unconsolidated, light gray to greenish gray, very fine-grained to fine-grained, dense (SM)		16/24/26							
20	S10			85.00	4.5+							
	S11		Clay, silty, light gray, hard (CL)		20	15.3		25	19	12	31.5	
	U12		- with clayey silt seams, stiff		4.5+							
25	U13				4.5+							
	U14				4.5+							
	U15				4.5+							
30	U16		Clay, light gray, hard (CH)	75.00	4.5+							
	U17				4.5+							
	U17			71.00	4.5+							
35	U18		Clay, with silt, light gray and reddish brown, with ferrous stains, hard (CH)		4.5+							
	U19				4.5+							
	S20				4.6+							
40	U21		- with silt partings		4.5+							
	U22				3.5							
	U22		- with very silty seams	61.00								
45	S23		Sand, silty, tan, unconsolidated, fine-grained to very fine-grained, dense (SP-SM)		12/18/18							
	S24				13/29/32							
	S25				13/18/33							
	S25				13/12/13							



BME LOG HAWTHORN PARK.GPJ BHM DATA TEMPLATE.GDT 12/28/20

Contractor: HET	Groundwater Observations	Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and Shelby tubes.
Method: HSA & Wet Rotary	Date	
Sampling Method: Split Spoon & Shelby	Depth	
Geologist/Engineer: S. Stamoulis	Tube	
Project No.: 101.24.102		

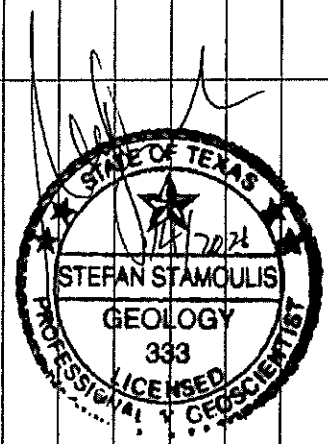
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-5

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Manefield, Texas 76063
Phone: 817-563-1144

Project Description: **Hawthorn Park**
Hawthorn Park Landfill

Depth, feet	Samples	Symbol / USCS	Location: E 3090967.000 N 750058.100	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf	
			Surface El.: 105.00 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/11/2019 Date Boring Completed: 2/12/2019										
MATERIAL DESCRIPTION													
	S28		Sand, silty, tan, unconsolidated, fine-grained to very fine-grained, dense (SP-SM) <i>(continued)</i> - with calcareous nodules, caliche, hard - reddish brown, dense to hard - tan	8/19/24									
	S27			9/19/27									
	NR28			18/32/26									
55	NR29			50/5									
	S30			50/4.5									
	S31			40/50-4									
60	S32			50-5 1/2									
	S32			60-4 1/2									
	S32			50-5 1/2									
65	S32			46/50/4									
	S33			50-5 1/2									
	S34			50-5 1/2									
70	S35			50/5									
	S36			40/42/5-2									
	S37			40/5-3"									
	S38			27.00									
	S39			3.0	Clay, sandy, brown, hard with ferrous stains (CL)								
80	S40			40/50/4									
	S41			3.0									
	S41	21.00											
	S42	42/50/5	Clay, reddish-brown and tan (CL)										
85	S43	50-5											
	NR44	4.5+	- no sample										
90	S45	4.5+											
	U46	4.5+											
95	U47	4.5+											
	U48	4.5+											
	U49	4.5+											
100		5.00											



BME LOG HAWTHORN PARK.GRJ B&M DATA TEMPLATE.GDT 12/29/20

Contractor:	HET	Groundwater Observations	Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and Shelby tubes.
Method:	HSA & Wet Rotary	Date	Depth
Sampling Method:	Split Spoon & Shelby Tube		
Geologist/Engineer:	S. Stamoulis		
Project No.:	101.24.102		



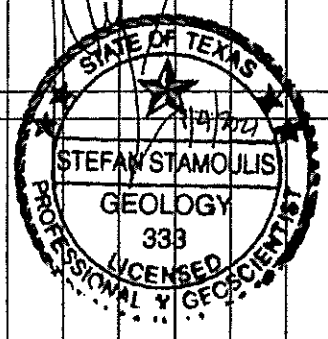
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-6

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Marshall, Texas 75683
Phone: 817-563-1144

**Project Description: Hawthorn Park
Hawthorn Park Landfill**

Depth, feet	Samples	Symbol / USCS	Location: E 3092220.000 N 751729.900	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Surface El.: 103.00 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/6/2019 Date Boring Completed: 2/7/2019									
MATERIAL DESCRIPTION												
	U1		Clay, silty, brown, with rock fragments, firm (CL)	1.5								
	U2		- light gray with ferrous stains, soft	1.0								
5	U3		- tan and gray, with ferrous stains, with calcareous nodules, firm	1.75								
	U4			1.75		17.5		42	12	30	67	
	U5		- light gray and tan, with ferrous stains, with calcareous nodules, stiff	2.5								
10	U6			93.00								
	U7		Clay, tan and reddish brown, trace ferrous stains, very stiff, hard (CH)	3.5								
	U8			4.5+		24.8		67	20	47	90	
	U9			89.00								
15	U10		Clay, silty, light gray, with ferrous stains, stiff (CL)	4.5								
	U11			2.0								
	U12			2.5								
20	U13			3.5		21.0		64	18	38	79	
	U14		- light gray and red, with ferrous stains, with calcareous nodules, hard	4.5								
	U15			4.5+		16.4	114.2	47	13	34	85	
	U16			4.5+								
25	U17			4.5+								
	U18			4.5+								
	U19			4.5+								
30	U20		Clay, with silt, reddish brown and tan, with silt partings, hard (CH)	4.5+								
	U21			64.00								
	S22		Clay, silty (CL)	63.00								
35	S23		Sand, silty, with clay and silt partings, reddish brown, stiff (SM)	2.0								
	S24			2/12/37								
	S25			2/12/17								
40				10/11/12								
45				10/12/10								
50				53.00								



BME LOG HAWTHORN PARK.GPJ BSM DATA TEMPLATE.GDT 12/29/20

Contractor:	HET	Groundwater Observations
Method:	HSA & Wet Rotary	Date
Sampling Method:	Split Spoon & Shelby Tube	Depth
Geologist/Engineer:	S. Stamoulis	
Project No.:	101.24.102	

Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and shelly tubes.



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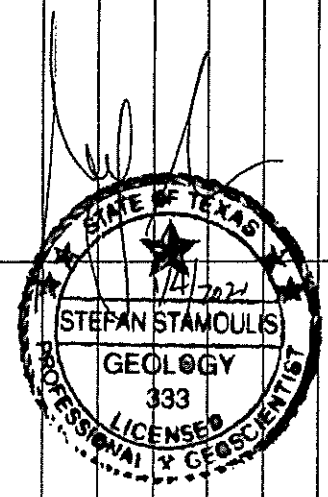
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-6

Biggs and Mathews Environmental
 1700 Robert Road, Suite 100
 Mansfield, Texas 76063
 Phone: 817-563-1144

Project Description: Hawthorn Park
Hawthorn Park Landfill

Depth, feet	Samples	Symbol / USCS	Location: E 3092220.000 N 751729.900	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
Surface El.: 103.00 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/6/2019 Date Boring Completed: 2/7/2019												
MATERIAL DESCRIPTION												
	S28		Clay, reddish brown, hard (CH)	51.00	4.5							
	S27		Sand, silty, with clay, reddish brown, stiff (SM)		N/A							
55	S28				N/A							
	S29				8/8/19							
	S30				10/12/19							
60				43.00								
	U31		Clay, with trace silt, reddish brown, hard (CH)		4.5+							
	U32				4.5+	28.4	86.3	75	23	52	100	
	U33				4.5+							
65	U34				4.5+							
	U35				4.5+							
70	U38				4.5+							
	U37				4.5							
	U38		- gray and reddish brown		4.5							
75	U39				4.5							
	U40				4.5							
80				23.00								
	U41		Clay, silty, reddish brown, firm (CL)		1.5							
	U42				1.75							
	U43		- with clay seams		1.5							
85	U44		- with silt, hard		4.8+							
	U45				4.5+							
90				13.00								
	U48		Clay, reddish brown, firm (CH)		4.5+							
	U47				4.5+							
	U48				4.6+							
95	U49				4.5+							
	U50				4.5+							
100				3.00								



BME LOG HAWTHORN PARK.GPJ B&M DATA TEMPLATE.GDT 12/28/20

Contractor: **HET**
 Method: **HSA & Wet Rotary**
 Sampling Method: **Split Spoon & Shelby Tube**
 Geologist/Engineer: **S. Stamoulis**
 Project No.: **101.24.102**

Groundwater Observations	
Date	Depth

Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and shelly tubes.



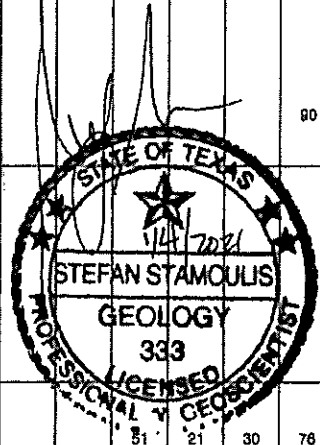
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
 LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-7

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Menafield, Texas 78063
Phone: 817-563-1144

**Project Description: Hawthorn Park
Hawthorn Park Landfill**

Depth, feet	Samples	Symbol / USCS	Location: E 3092531.000 N 752026.300	Hand Penetrometer, lbf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, lbf
			Surface El.: 97.80 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/6/2019 Date Boring Completed: 2/7/2019									
MATERIAL DESCRIPTION												
	U1		Clay, sandy, dark gray to brown, firm (CL)	1.0								
	U2		Clay, silty, with sand, tan, firm (CL)	95.80	1.0							
5	U3		Clay, with silt, tan, stiff (CL)		3.5	18.3		37	13	24	52	
	U4		- with calcareous nodules		3.5							
	U5				3.5							
10	U6		Clay, dark gray and tan, hard (CH)	87.80	4.0							
	U7		- with ferrous stains		4.5	21.0	107.2	59	17	42	98	
	U8		- gray and tan, with ferrous stains, hard		4.5							
15	U9				4.5+							
	U10				4.5							
20	U11		- brown, with ferrous stains		4.5							
	U12				4.5							
25	U13				4.5	19.1		55	17	38	82	
	U14		- light brown, with ferrous stains, hard		4.5+							
	U15				4.5+							
30	U16		- light gray and light brown		4.5+							
	U17		- with calcareous nodules, hard		4.5+							
	U18		- reddish brown		4.5+							
35	U19				4.5+						80	
	U20		Clay, silty, reddish brown (CL)	59.80	3.5							
40	S21		- with an abundance of silt, reddish brown, stiff, dense		3/23/20							
	U22				2.5							
45	S23		- with sand		6/7/11							
	S24		Clay, reddish brown, hard (CL)	51.80	10/15/11							
	S25				4.5+							



BME LOG HAWTHORN PARK.GPJ B&M DATA TEMPLATE.GDT 12/28/20

Contractor: HET Method: HSA & Wet Rotary Sampling Method: Split Spoon & Shelby Tube Geologist/Engineer: S. Stamoulis Project No.: 101.24.102	Groundwater Observations Date: _____ Depth: _____	Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and shelly tubes.
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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-7

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 76063
Phone: 817-563-1144

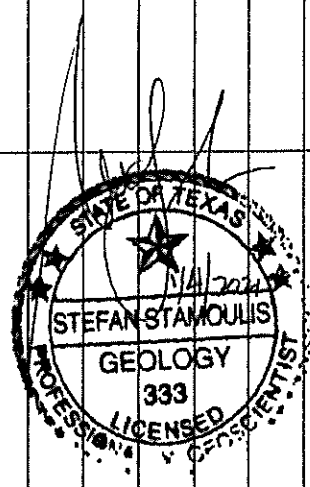
Project Description: **Hawthorn Park**
Hawthorn Park Landfill

Location: **E 3092531.000 N 752026.300**

Surface El.: **97.80 ft. msl**
Completion Depth: 100.0 ft.
Date Boring Started: 2/6/2019
Date Boring Completed: 2/7/2019

MATERIAL DESCRIPTION

Depth, feet	Samples	Symbol / USCS	Material Description	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	S28		Clay, reddish brown, hard (CL) <i>(continued)</i>	45.80								
	S27		Silt (ML)	43.80		26.3					73	
55	S28		Sand, silty (SM) - very silty	41.80								
	S29		Clay (CL)									
	S30											
60	U31		- with trace ferrous stains									
	U32			33.80								
65	S33		Clay (CH) - reddish brown and gray									
	U34			29.80								
	U35		Clay, reddish and gray (CL)									
70	S38			25.80								
	U37		Clay, gray with ferrous stains, with calcareous nodules, hard (CH)									
75	S38			21.80								
	U39		Clay, reddish brown and gray (CL)									
	S40											
80	S41											
	S42											
85	U43		- reddish brown and gray, hard	11.80								
	S44		Clay, reddish brown and gray, hard (CH)									
	U45											
90	S46											
	U47											
95	U48											
	U49											
	U50											
100				-2.20								



BME LOG HAWTHORN PARK.GPJ BEM DATA TEMPLATE.GDT 12/29/20

Contractor: **HET**
Method: **HSA & Wet Rotary**
Sampling Method: **Split Spoon & Shelby Tube**
Geologist/Engineer: **S. Stamoulis**
Project No.: **101.24.102**

Groundwater Observations	
Date	Depth

Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and shelly tubes.



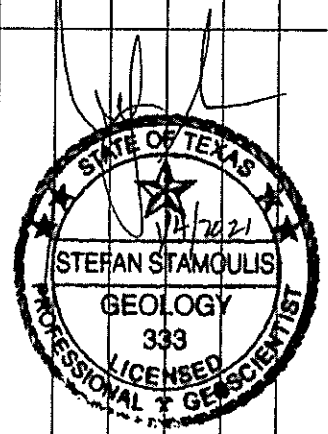
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-8

Biggs and Mathews Environmental
 1700 Robert Road, Suite 100
 Mansfield, Texas 76063
 Phone: 817-563-1144

Project Description: Hawthorn Park
Hawthorn Park Landfill

Depth, feet	Samples	Symbol / USCS	Location: E 3093812.000 N 751176.300	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Surface El.: 104.70 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/5/2019 Date Boring Completed: 2/6/2019									
MATERIAL DESCRIPTION												
	A1		Fill (ML)	103.70								
	U2		Clay, silty, with sand, dark brown, with rocks and gravel (CL)	4.0								
5	U3		Sand, clayey, dark gray to black, with calcareous nodules, hard (SC) - gray and brown, with ferrous stains, with calcareous nodules	100.70	4.5							
	U4			2.0	17.1	28	11	17	43			
	U5			2.5								
10	U6			2.0								
	U7			1.75								
15	S8			57/8								
	U9		Clay, light reddish brown and tan, with ferrous stains, hard (CL) - tan and light gray, with calcareous nodules	88.70	4.0							
	U10			4.5+								
20	U11			4.5	17.3	47	13	34	62			
	U12			4.5+								
	U13			4.5								
25	U14		Clay, tan and reddish brown, hard (CH) - reddish brown, with siltstones	78.70	4.5+							
	U15			4.5								
30	U16			4.6								
	U17			4.5								
	U18			4.5								
35	U19		- with silt partings									
	U20			4.5								
	U21			4.6								
40	U22			4.5								
	U23			62.70	4.5							
45	S23		Clay, silty, with clay seams, reddish brown, firm (CL) - with trace sand									
	S24			58.70	10/12							
	S25		Sand, silty, tan to reddish brown (SM)									
50				54.70	4/3/8							
					4/4/5							



BME LOG HAWTHORN PARK.GPJ B&M DATA TEMPLATE.GDT 12/23/20

Contractor:	HET	Groundwater Observations	
Method:	HSA & Wet Rotary	Date	Depth
Sampling Method:	Split Spoon & Shelby Tube		
Geologist/Engineer:	S. Stamoulis		
Project No.:	101.24.102		

Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and shelly tubes.

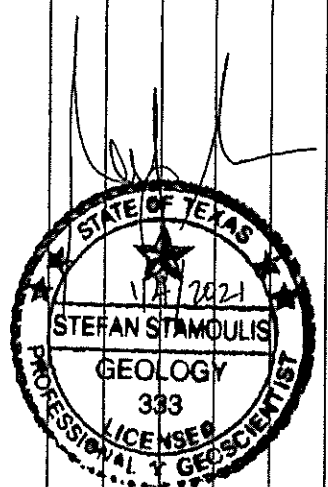


LOG OF BORING NO. BME-8

Biggs and Mathews Environmental
 1700 Robert Road, Suite 100
 Mansfield, Texas 76063
 Phone: 817-563-1144

Project Description: **Hawthorn Park
 Hawthorn Park Landfill**

Depth, feet	Samples	Symbol / USCS	Location: E 3093812.000 N 751176.300	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
MATERIAL DESCRIPTION												
	S26		Clay, silty, with clay seams, reddish brown, firm (CL)	52.70	8/8/7							
	U27		Clay, with sand, reddish brown, stiff (CL)	50.70	3.0							
55	U28		Clay, silty, with sand, reddish brown, firm (CL)		1.5							
	S29			46.70	8/8/9							
60	S30		Sand, silty, reddish brown, unconsolidated, very fine-grained, dense (SM)		25/50-3							
	S31				50/5"							
	S32			41.70	8/8/17							
65	U33		Clay, silty, dark reddish brown, with silt partings, hard (CL)	38.70	4.5							
	U34		Clay, dark reddish brown, hard (CH)		4.5							
	U35				4.5							
70	U36				4.5							
	U37				4.5+							
75	U38				4.0							
	U39				4.5							
	U40				4.5							
80	U41				3.0							
	U42				3.5							
85	U43		- tan and reddish brown, with calcareous nodules, with clay stone partings, very stiff to hard		2.0							
	U44				3.5							
	U45		- reddish brown, with calcareous nodules, hard		4.0							
90	U46				4.5							
	U47				4.0							
95	U48		- reddish brown, with silt partings, trace calcareous nodules, hard		4.0							
	U49				4.0							
	U50				4.5							
100				4.70								



BME LOG HAWTHORN PARK.GPJ BAH DATA TEMPLATE.GDT 12/28/20

Contractor: HET Method: HSA & Wet Rotary Sampling Method: Split Spoon & Shelby Tube Geologist/Engineer: S. Stamoulis Project No.: 101.24.102	Groundwater Observations Date: _____ Depth: _____	Remarks: Borehole grouted upon completion. Wet rotary rig, split spoons, and shelly tubes.
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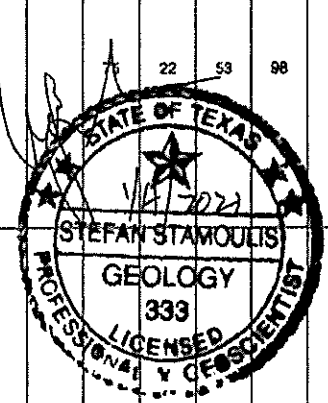
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
 LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-9

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 76063
Phone: 817-563-1144

Project Description: **Hawthorn Park**
Hawthorn Park Landfill

Depth, feet	Samples	Symbol / USCS	Location: E 3093912.000 N 750049.000	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Surface El.: 100.00 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 1/31/2019 Date Boring Completed: 2/1/2019									
MATERIAL DESCRIPTION												
	S1		Fill (CL)	98.00	4.0							
	U2		Clay, with sand seams, gray and tan (CL)	96.00	2.5	14.5		31	11	20	53	
5	U3		Clay, sandy (CL)		3.0							
	U4			92.00								
	U6		Sand, clayey, with ferrous stains, hard (SC)	90.00	4.5	18.4		35	17	18	43	
10	S6		Sand, silty, tan, unconsolidated, very fine-grained to fine-grained, loose, with moisture (SM) - with trace clay, tan to light brown, with ferrous stains, loose		4.4/4							
	S7			86.00		4.5/8						
15	S8		Sand, tan, unconsolidated, very fine-grained to fine-grained, loose (SP)		4.6/7							
	S9			6/8/9								
	S10			6/4/7								
20	S11			8/6/10								
	S12			7/13/12	76.00							
25	S13		Sand, silty, brown, unconsolidated, very fine-grained to fine-grained, moderately dense (SM)		8/8/13							
	S14			9/24/21								
	S15			7/21/23								
30	NR			6/19/18	68.50							
35	U17		Clay, reddish brown, with ferrous stains, hard (CH) - with calcareous nodules		4.5	32.3		86	27	59	97	
	U18			4.5								
	U19			4.5								
	U20			4.5+								
40	U21			58.00								
	U22		Clay, with silt, brown, with ferrous stains (CH)		4.5							
45	U23		- with silt partings, vertical		4.5							
	U24			4.0								
	U25			4.5								



BME LOG HAWTHORN PARK.GPJ B&M DATA TEMPLATE.GDT 12/29/20

Contractor: HET	Groundwater Observations	Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and Shelby tubes.
Method: HSA & Wet Rotary	Date	
Sampling Method: Spill Spoon & Shelby Tube	Depth	
Geologist/Engineer: S. Stamoulis		
Project No.: 101.24.102		



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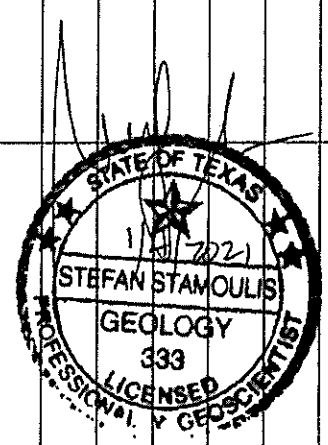
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-9

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 76063
Phone: 817-563-1144

Project Description: **Hawthorn Park**
Hawthorn Park Landfill

Depth, feet	Samples	Symbol / USCS	Location: E 3093912.000 N 750049.000	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf	
			Surface El.: 100.00 ft. msf Completion Depth: 100.0 ft. Date Boring Started: 1/31/2019 Date Boring Completed: 2/1/2019										
MATERIAL DESCRIPTION													
55	U26	[Diagonal Hatching]	Clay, with silt, brown, with ferrous stains (CH) <i>(continued)</i> - reddish brown and tan	4.5+									
	U27			4.5									
	U28			4.5+									
	U29			4.5									
	U30			41.00									
60	S31	[Dotted Pattern]	Sand, silty, reddish brown and tan, very fine-grained to fine-grained, dense (SM)	30/50									
	S32			50									
	S33			30/30/30									
65	S33			34.00									
70	U34	[Diagonal Hatching]	Clay, with silt, dark reddish brown and dark gray, with ferrous stains, hard (CH) - greenish gray - with trace silt	3.0									
	U35			3.5	25.8	52	19	33	93				
	U36			3.0									
	U37			3.5									
75	U38			4.0									
	U39	3.0											
	U40	3.0											
80	S41	[Dotted Pattern]	Sand, tan and light brown, unconsolidated, fine-grained, moderately dense (SP-SC) - with some clay	20.00									
	S42			13/13/16									
	S43			12/14/15									
85	S43			14/13/17									
	S44	15/15/15											
	S44	13.00											
90	U45	[Diagonal Hatching]	Clay, silty, dark reddish brown, hard (CH)	4.5+									
	U46			4.5+									
	U47			4.5+									
95	U48												
	U49												
	U50												
100				0.00									



BME LOG HAWTHORN PARK.GPJ B&M DATA TEMPLATE.GDT 12/29/20

Contractor:	HET	Groundwater Observations	Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and shelly tubes.
Method:	HSA & Wet Rotary	Date	Depth
Sampling Method:	Split Spoon & Shelby Tube		
Geologist/Engineer:	S. Stamoulis		
Project No.:	101.24.102		



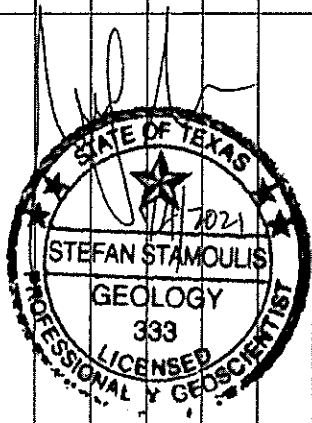
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-10

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 76063
Phone: 817-563-1144

**Project Description: Hawthorn Park
Hawthorn Park Landfill**

Depth, feet	Samples	Symbol / USCS	Location: E 3091289.000 N 749368.000	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
Surface El.: 105.20 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/22/2019 Date Boring Completed: 2/25/2019												
MATERIAL DESCRIPTION												
	U1		Clay, silty, dark gray and dark brown, firm to stiff (CL)	1.5								
	U2		- with calcareous nodules, shell fragments	2.0								
5	U3		- with sand, with ferrous stains, stiff to hard	2.0		16.3		96	13	23	61	
	U4			97.20								
	U5		Clay, sandy, tan and gray with ferrous stains (CL)	2.5								
10	U6			2.0								
	U7		- with sandy seams	3.0								
	U8			91.20								
15	S9		Sand, silty, with clay, light gray, unconsolidated, moist, loose (SM)	.5								
	S10		- dense	24/26/50-2'								
	S10		- unconsolidated, very fine-grained to fine-grained, dense	25/50-4'								
	S10			85.20								
20	U11		Clay, with sand seams, light gray, with ferrous stains, hard (CL)	3.0								
	U12			3.5								
25	U13			4.0		17.2		34	13	21	54	
	U14			3.5								
	U15			3.5								
30	U16			3.5								
	S17			73.20								
	S17		Sand, silty, tan to light brown, unconsolidated, very fine-grained, dense (SP-SM)	7/30/34								
35	S18			18/19/35								
	S19			50-5'								
	S20			50/50-2'								
40	S21			20/30/50-2'								
	S22			20/45/49								
45	S23			10/50-3'								
	S24			10/50-5'								
	S25			50-1'								



BME LOG HAWTHORN PARK.GPJ B3M DATA TEMPLATE.GDT 12/29/20

Contractor: HET	Groundwater Observations	Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and shelly tubes.	
Method: HSA & Wet Rotary	Date		
Sampling Method: Split Spoon & Shelby Tube	Depth		
Geologist/Engineer: S. Stamoulis			
Project No.: 101.24.102			

LOG OF BORING NO. BME-10

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 76063
Phone: 817-563-1144

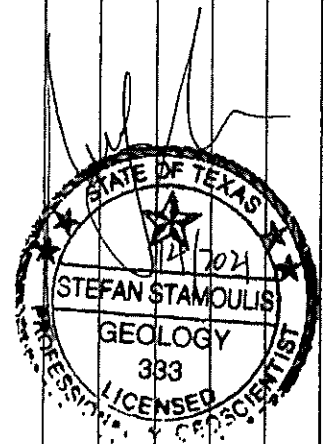
Project Description: **Hawthorn Park**
Hawthorn Park Landfill

Location: **E 3091289.000 N 749368.000**

Surface El.: **105.20 ft. msl**
Completion Depth: **100.0 ft.**
Date Boring Started: **2/22/2019**
Date Boring Completed: **2/25/2019**

MATERIAL DESCRIPTION

Depth, feet	Samples	Symbol / USCS	Material Description	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf	
55	S26	[Stippled Pattern]	Sand, silty, tan to light brown, unconsolidated, very fine-grained, dense (SP-SM) <i>(continued)</i> - tan and light reddish brown, very fine-grained to fine-grained, dense	50.5									
	S27			50.3									
	S28			49.50-2									
	S29			50.3									
	S30			50.3									
60	S31			50.3									
	S32			50.5 1/2									
	S33			50.6									
	S34			50.5 1/2									
	U36					36.20							
70	U36	[Diagonal Hatching]	Clay, reddish brown, hard (CH)	4.5+									
	U37			33.20									
	U38	[Cross-hatching]	Clay, reddish brown, with calcareous nodules (CL)	4.5		18.8		32	13	19	68		
	U39			4.5									
75	U40			4.5									
	U41			4.5									
	U42			4.5									
80	U43	[Vertical Hatching]	Clay, silty, with clay stone, reddish brown, with calcareous nodules, hard (CL) - with silt partings	25.20									
	U44			2.0									
	U45			4.0									
85	U46			4.5									
	U47			1.0									
	U48			4.0									
90	U49			4.5									
	U50			4.5									
				5.20									



BME LOG HAWTHORN PARK.GPJ BSM DATA TEMPLATE.GDT 12/29/20

Contractor:	HET	Groundwater Observations	Remarks: Borehole grouted upon completion. Wet rotary rig, splitspoons, and shelly tubes.
Method:	HSA & Wet Rotary	Date	
Sampling Method:	Split Spoon & Shelby Tube	Depth	
Geologist/Engineer:	S. Stamoulis		
Project No.:	101.24.102		



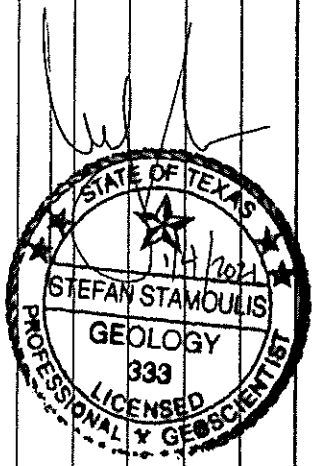
The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-11

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 76063
Phone: 817-563-1144

Project Description: **Hawthorn Park**
Hawthorn Park Landfill

Depth, feet	Samples	Symbol / USCS	Location: E 3091287.000 N 749703.000	Hand Penetrometer, lsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, lsf
			Surface El.: 103.06 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/15/2019 Date Boring Completed: 2/18/2019									
MATERIAL DESCRIPTION												
	A1		Clay, silty, with organics, brown, hard (CL)	4.5								
	U2			99.06								
5	U3		Clay, silty, reddish brown and gray, with calcareous nodules, hard (CL)	3.0								
	U4			2.5		23.8	101.3	46	16	30	33	
	U5			95.06								
	U6		Sand, clayey, light gray, firm (SC)	1.5		17.1		36	14	21	45	
10	U8		- with clay pockets, firm, wet	1.0								
	S7			91.06								
	S8		Sand, silty, gray, unconsolidated, very fine-grained, loose (SP-SM)	4/6/10								
15	S9		- firm	4/8/12								
	S10			7/7/13								
	S11			8/13/15								
20	S12		- tan to light brown, unconsolidated, very fine-grained, stiff	10/15/16								
	S13			10/16/16								
25	S14			11/17/17								
	S15			13/14/16								
	S16		- light reddish brown, unconsolidated, very fine-grained to fine-grained, dense	14/16/19								
30	S17			15/28/30								
	S18			17/30/35								
35	S19			50/55*								
	S20			50/50-4'								
40	S21		Sand, tan, unconsolidated, very fine-grained to fine-grained, dense to hard (SP)	65.06								
	S22			30/35/50-3'								
	S23			20/40/50-2'								
45	NR			15/50-3'								
	NR			40/50-5'								
50	NR			50-55*								



BME LOG HAWTHORN PARK.GPJ, BSM DATA TEMPLATE.GDT 12/29/20

Contractor: HET Method: HSA & Wet Rotary Sampling Method: Split Spoon & Shelby Tube Geologist/Engineer: S. Stamoulis Project No.: 101.24.102	Groundwater Observations Date: _____ Depth: _____	Remarks: Borehole grouted upon completion.
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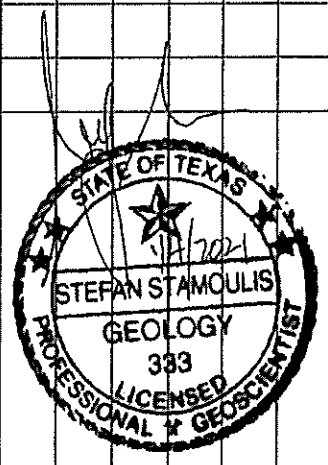


LOG OF BORING NO. BME-11

Biggs and Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 76063
Phone: 817-563-1144

Project Description: **Hawthorn Park**
Hawthorn Park Landfill

Depth, feet	Samples	Symbol / USCS	Location: E 3091287.000 N 749703.000	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Surface El.: 103.06 ft. msl Completion Depth: 100.0 ft. Date Boring Started: 2/15/2019 Date Boring Completed: 2/18/2019									
MATERIAL DESCRIPTION												
55	S24		Sand, tan, unconsolidated, very fine-grained to fine-grained, dense to hard (SP) <i>(continued)</i>	50-5 1/2								
	U25				40-50-3							
	S26			50-5 1/2								
	U27		Sand, clayey, with sand layers alternating, reddish brown, firm (SC)	47.06	1.5							
	S28		Clay (CH)	45.06								
60	S29		Sand, with alternating clay and clayey sand, light brown (SP) - very fine-grained to fine-grained, dense	40-50-3								
	S30				50-5 1/2							
	S31				50-5							
	U32		Clay, with trace ferrous stains, reddish brown, hard (CH)	37.06	4.5	25.1		80	20	40	90	
	U33			4.5								
70	U34		Clay, sandy, with trace calcareous nodules, red and gray, hard (CL)	33.06	4.5+							
	U35				4.5+							
	U36				28.06	4.5+						
75	U37		Clay, silty, with abundant calcareous nodules, red and gray, hard (CL)		4.5+							
	NR		- abundant calcareous nodules	23.06								
80	S39		Clay, silty, reddish brown, dense (CL)	21.06	51/43/40							
	S40		Silt, with sand, reddish brown, dense (ML)	19.06	30/40/30							
85	U41		Clay, dark reddish brown, hard (CH) - with silt partings - with calcareous nodules - light reddish brown to light greenish - light greenish brown	4.5+								
	U42				4.6+							
	U43				4.5+							
90	U44				4.5+							
	U45				4.5+							
95	U46				4.5+							
	U47				4.5+							
	U48				4.5+							
100				3.06								



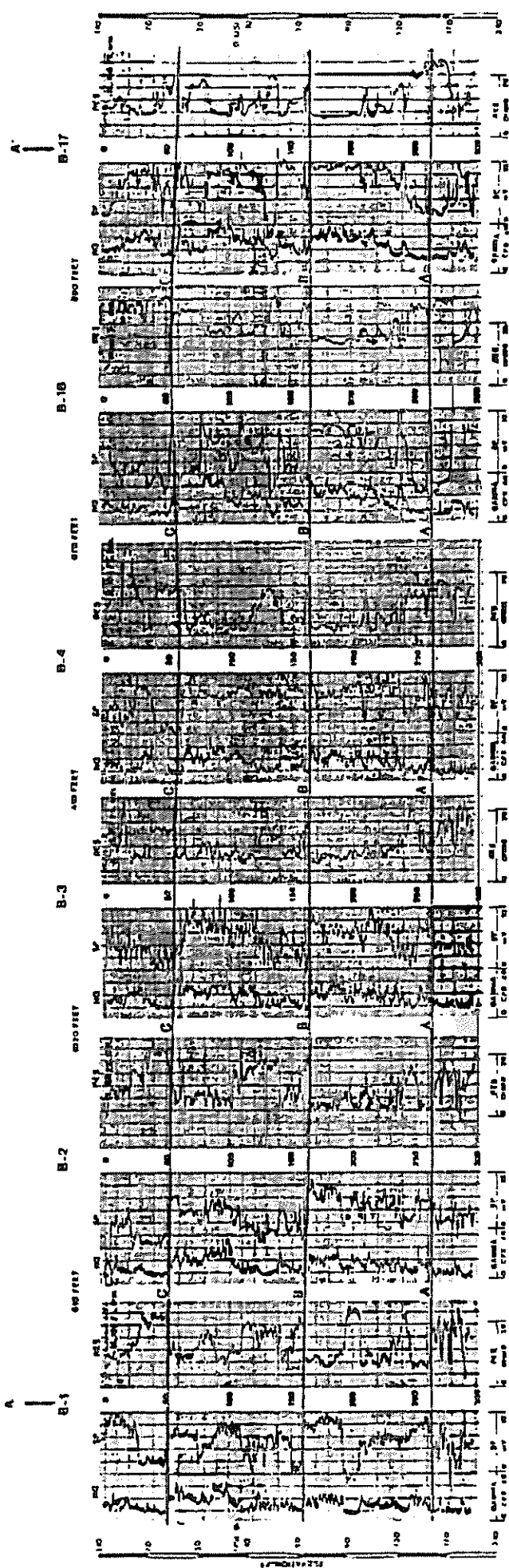
BME LOG HAWTHORN PARK.GPJ BSM DATA TEMPLATE.GDT 12/29/20

Contractor:	HET	Groundwater Observations	Remarks: Borehole grouted upon completion.
Method:	HSA & Wet Rotary	Date	Depth
Sampling Method:	Split Spoon & Shelby	Tube	
Geologist/Engineer:	S. Stamoulis		
Project No.:	101.24.102		



The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

**MCBRIDE RATCLIFF ASSOCIATES
GEOPHYSICAL BORINGS
1992**



HAWTHORN PARK RECLAMATION PROJECT AND RECYCLING CENTER
 HILLES COUNTY, TEXAS

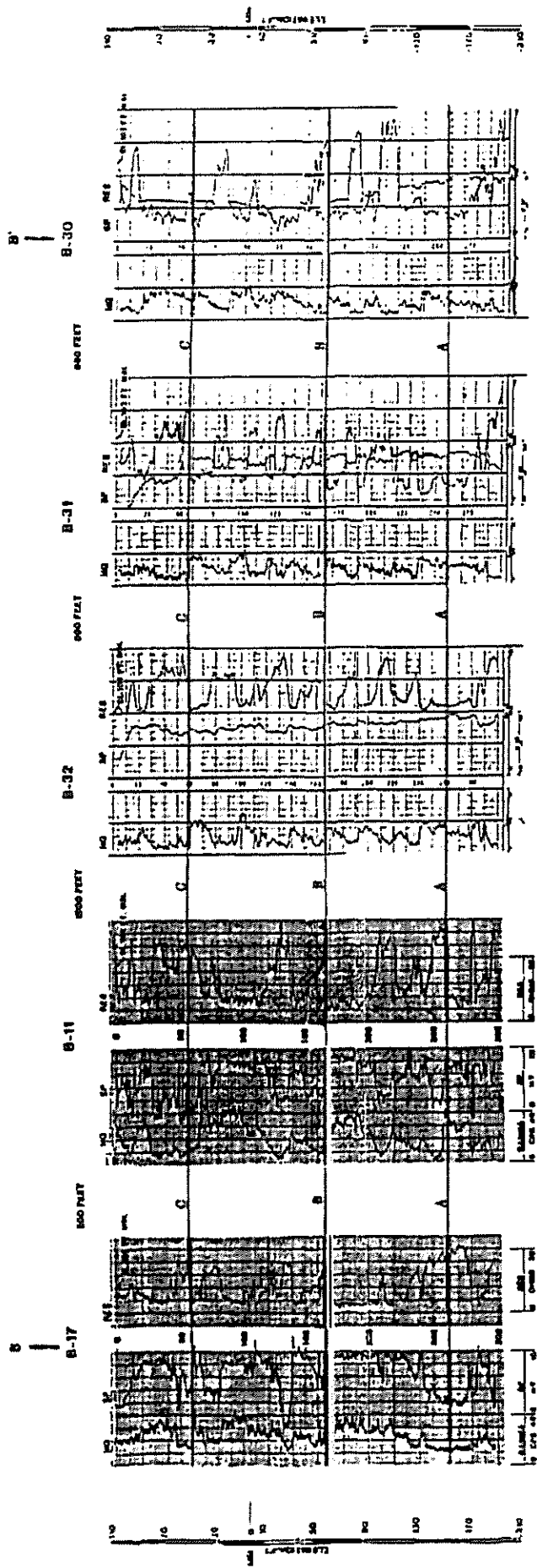
SANFILL OF TEXAS, INC.
 HOUSTON, TEXAS

McEirde-Ratcliff and Associates, Inc.
 Geological Consultants
 Houston, Texas

DATE	1/17/83
TIME	8:15
BY	J. R. RAY
CHECKED BY	J. R. RAY

CROSS-SECTION A-A'
 B-8

- LEGEND:**
- NG = NATURAL GAMMA RAY
 - SP = SPONTANEOUS POTENTIAL
 - RES = SINGLE POINT RESISTANCE
 - A---A' = DESIGNATED CROSS-SECTION
 - DESIGNATES INTERPRETED MARKER BEDS



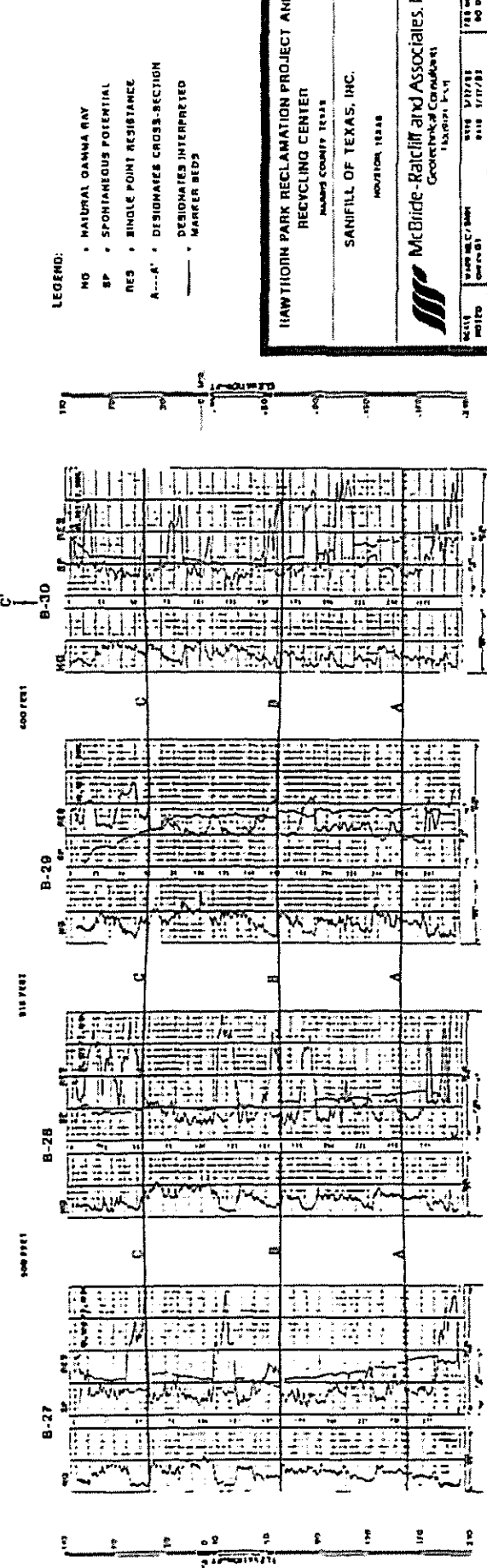
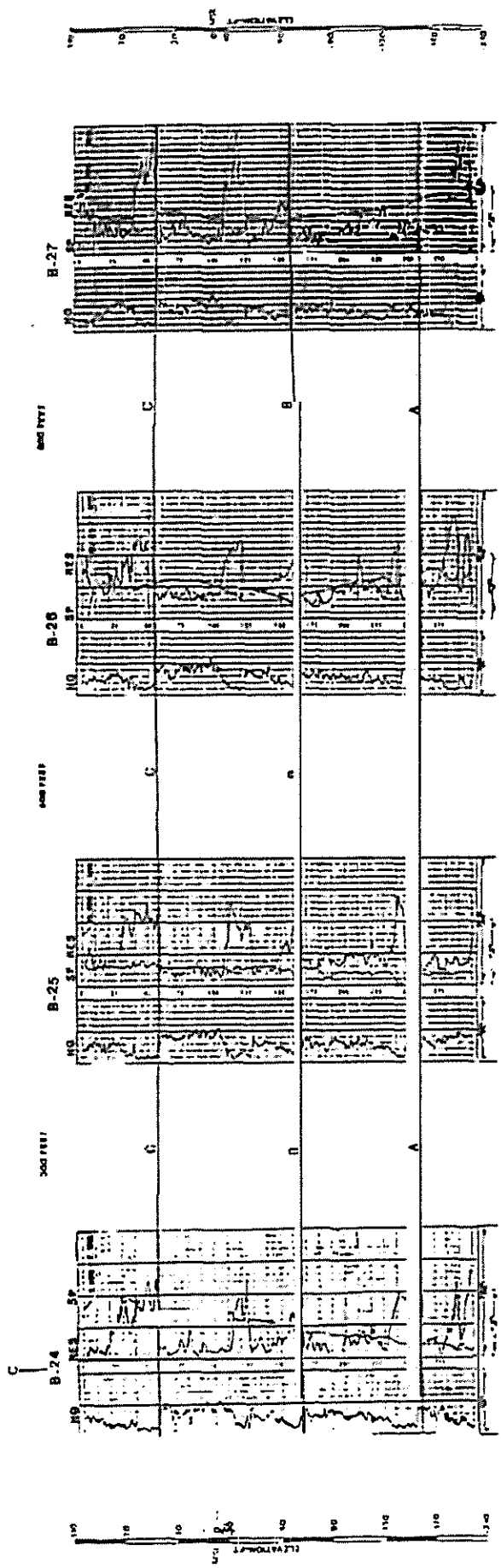
HAWTHORN PARK RECLAMATION PROJECT AND RECYCLING CENTER
 TARRANT COUNTY, TEXAS

SANFILL OF TEXAS, INC.
 HOUSTON, TEXAS

McBride-Raichiff and Associates, Inc.
 Geotechnical Consultants
 13401 K.A.O.

SCALE	VERT. 1" = 10'	HORIZ. 1" = 10'
DATE	NOV. 1974	NOV. 1974
PROJECT	HAWTHORN PARK RECLAMATION PROJECT AND RECYCLING CENTER	
CROSS-SECTION	B-B'	
FIGURE	D-9	

- LEGEND:**
- NGR * NATURAL GAMMA RAY
 - SP * SPONTANEOUS POTENTIAL
 - BR * BROMIDE POINT RESISTANCE
 - A---A' * DESIGNATED CROSS-SECTION
 - * DESIGNATED INTERPRETED
 - * * * * * MARKER BEDS



LEGEND:

- NO * NATURAL GAMMA RAY
- SP * SPONTANEOUS POTENTIAL
- RES * SINGLE POINT RESISTANCE
- A---A' * DESIGNATES CROSS-SECTION
- DESIGNATES INTERPRETED
- MARKER BEDS

HAWTHORN PARK RECLAMATION PROJECT AND RECYCLING CENTER
 HARRIS COUNTY TEXAS

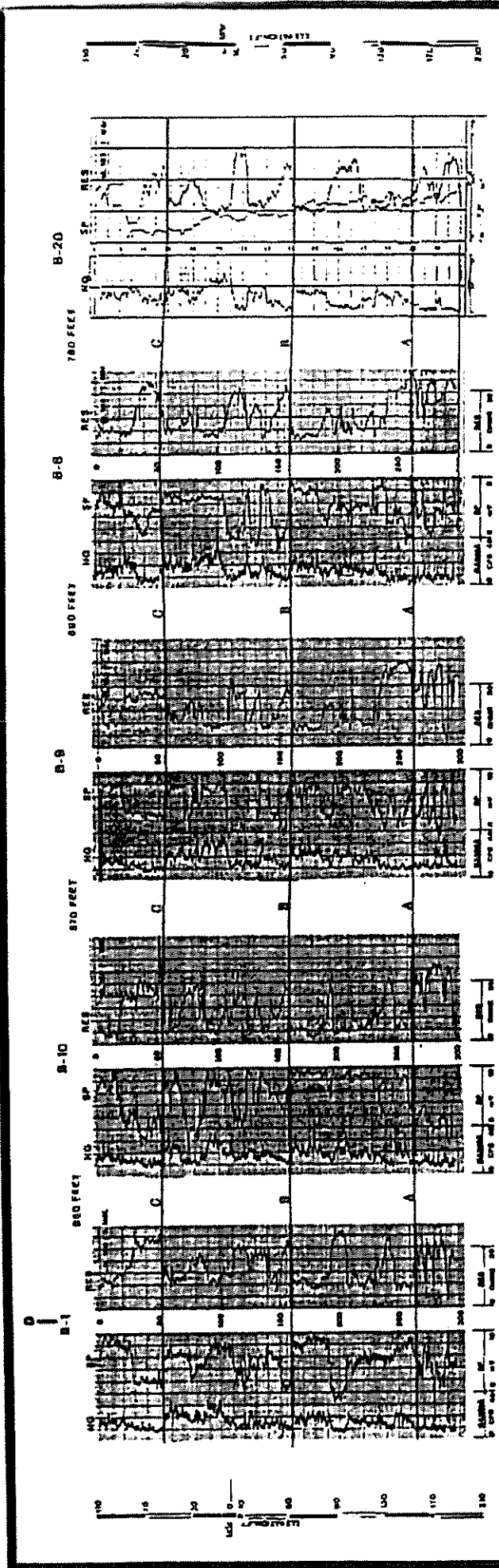
SANFILL OF TEXAS, INC.
 HOUSTON, TEXAS

McBride-Ratliff and Associates, Inc.
 Geotechnical Consultants
 Houston, Texas

SCALE	DATE	BY	CHKD BY
1" = 100'	1/17/88	SAE	SAE
REVISED	DATE	BY	CHKD BY

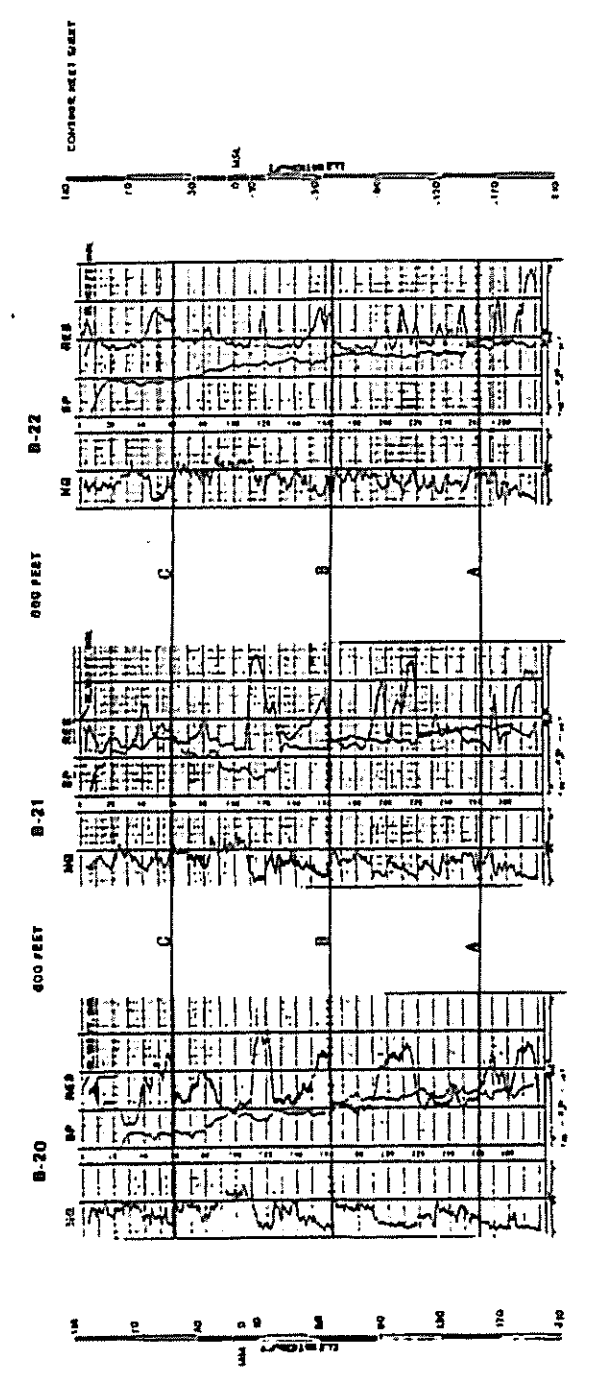
CROSS-SECTION C-C'

D-10



LEGEND:

- NO * NATURAL GAMMA RAY
- SP * SPONTANEOUS POTENTIAL
- RES * SINGLE POINT RESISTANCE
- A...A' * DESIGNATES CROSS SECTION
- DESIGNATES INTERPRETED
- MARKER BEIS



HAWTHORN PARK RECLAMATION PROJECT AND RECYCLING CENTER
 HENRIE COUNTY, TEXAS

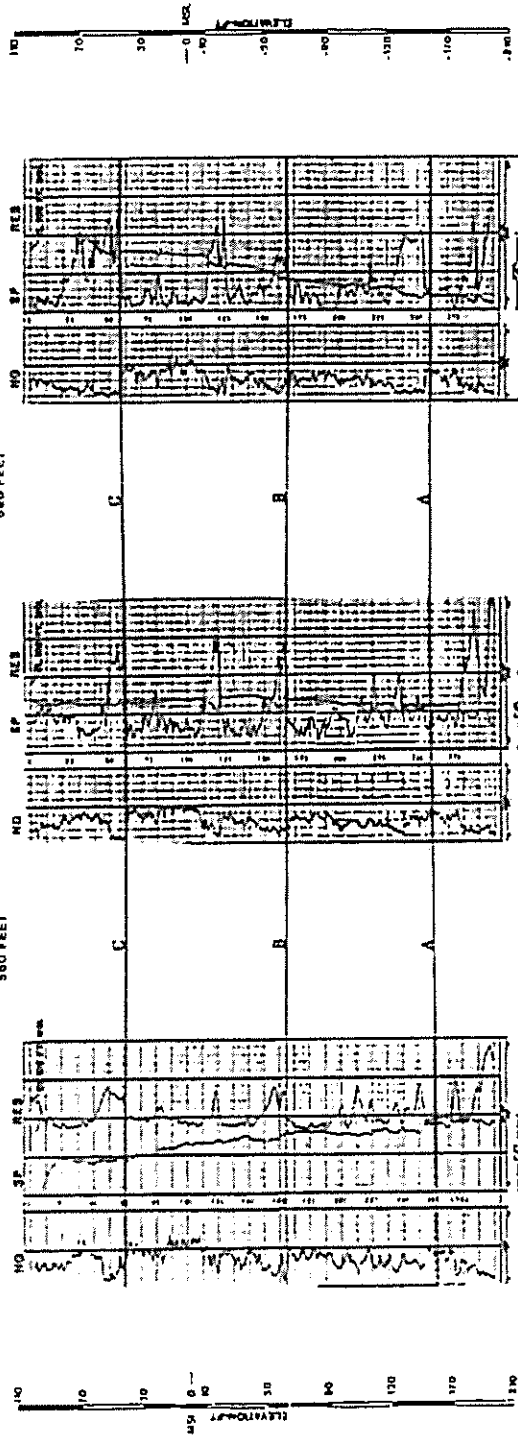
SANFILL OF TEXAS, INC.
 HOUSTON, TEXAS

McBride-Raiffitt and Associates, Inc.
 GEOTECHNICAL CONSULTANTS
 14-1000 4th St.
 HOUSTON, TEXAS 77002

DATE: 1/17/82
 DATE: 1/17/82

CROSS-SECTION D-D' **D-11**

CONTINUE FROM PREVIOUS SHEET



LEGEND:

- NO * NATURAL GAMMA RAY
- SP * SPONTANEOUS POTENTIAL
- RES * SINGLE POINT RESISTANCE
- A---A' * DESIGNATES CROSS-SECTION
- * DESIGNATES INTERPRETED
- * MARKER BEDS

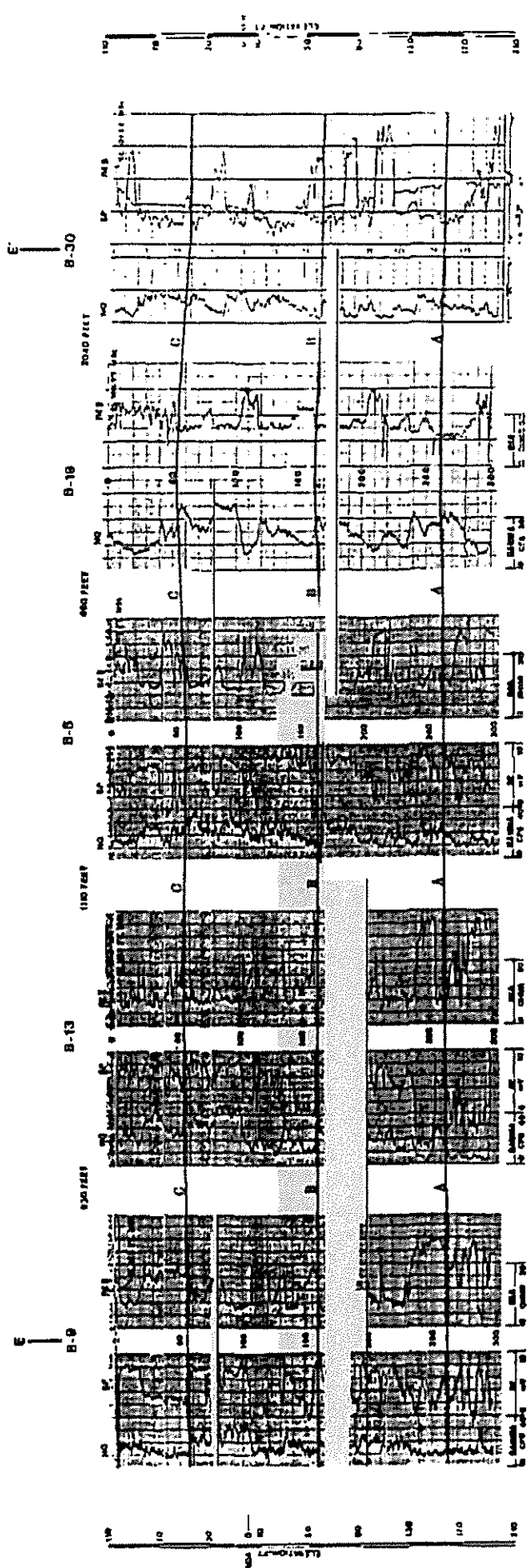
HAWTHORN PARK RECLAMATION PROJECT AND
RECYCLING CENTER
HARRIS COUNTY, TEXAS

SANFRE OF TEXAS, INC.
HOUSTON, TEXAS

McBride-Ratliff and Associates, Inc.
Geophysical Consultants
HOUSTON, TEXAS

DATE	BY	DATE	BY
1/17/88	1/17/88	1/17/88	1/17/88

CROSS-SECTION D-D'
D-12



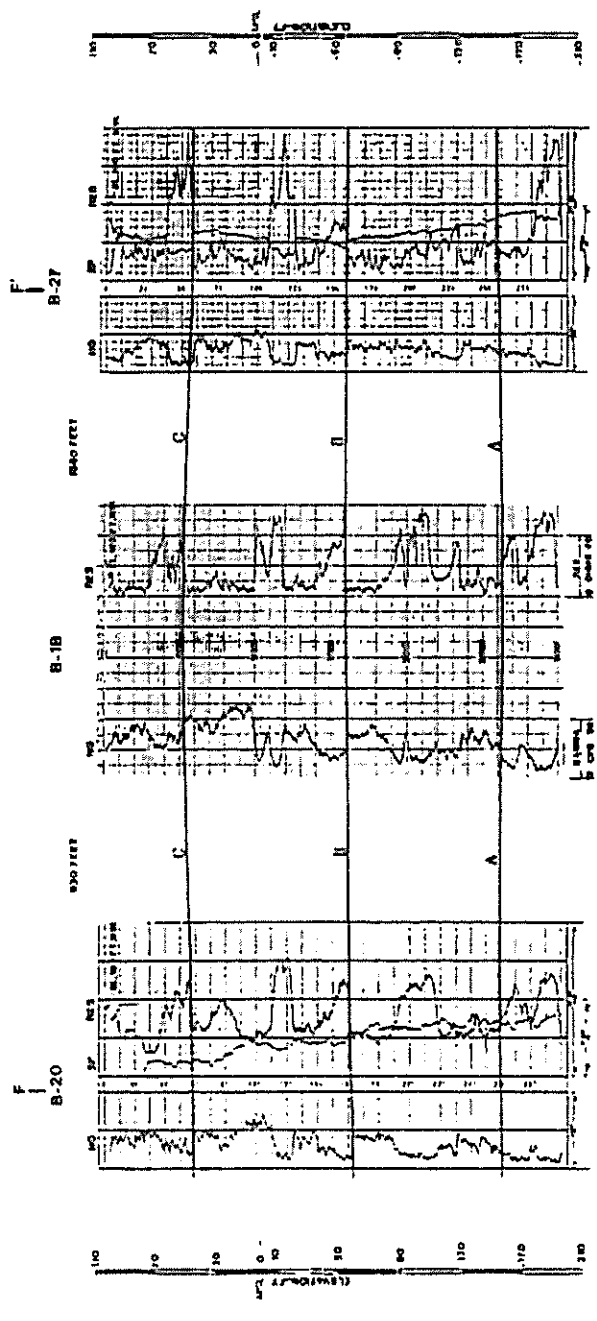
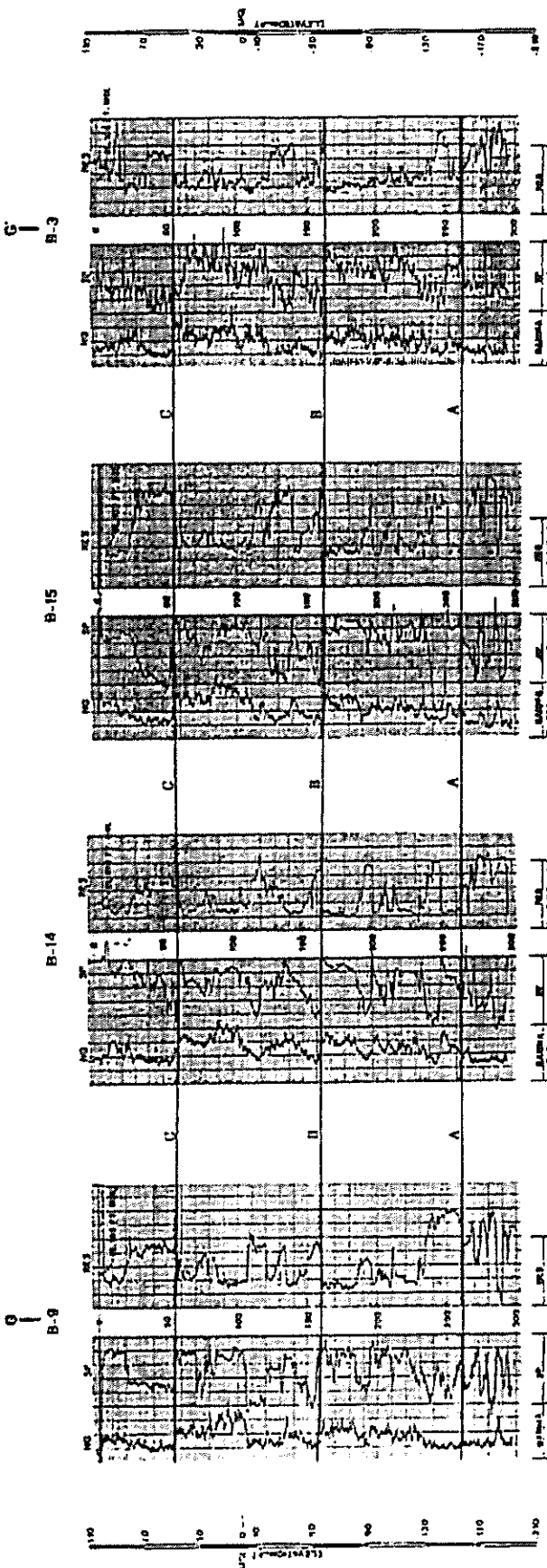
HAWTHORN PARK RECLAMATION PROJECT AND
RECYCLING CENTER
HARRIS COUNTY, TEXAS

SANFILL OF TEXAS, INC.
HOUSTON, TEXAS

McBride-Ratliff and Associates, Inc.
Geotechnical Consultants
Houston, Texas

DATE	1/17/83	SCALE	AS SHOWN
NO. 108	1/17/83	NO. 108	1/17/83
CROSS-SECTION E E'			
			D-13

- LEGEND:**
- RD • NATURAL GAMMA RAY
 - SP • SPONTANEOUS POTENTIAL
 - RES • SINGLE POINT RESISTANCE
 - A--A' • DESIGNATES CROSS-SECTION
 - DESIGNATES INTERPRETED MARKER BEDS



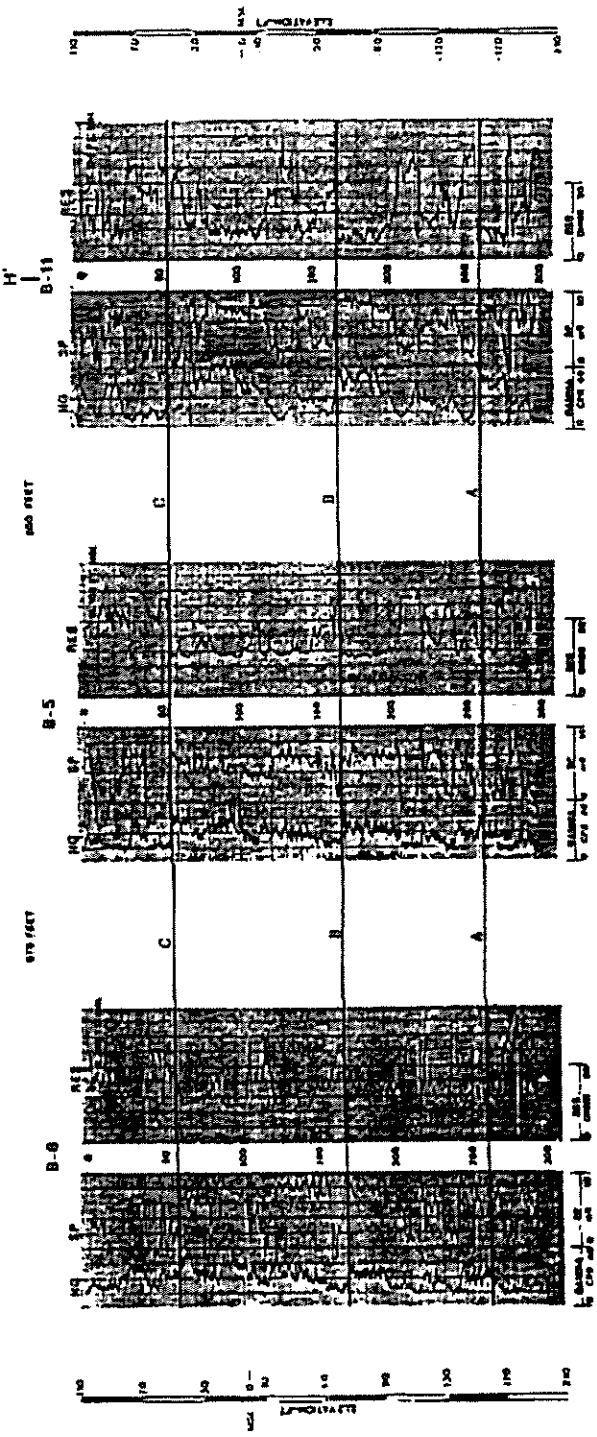
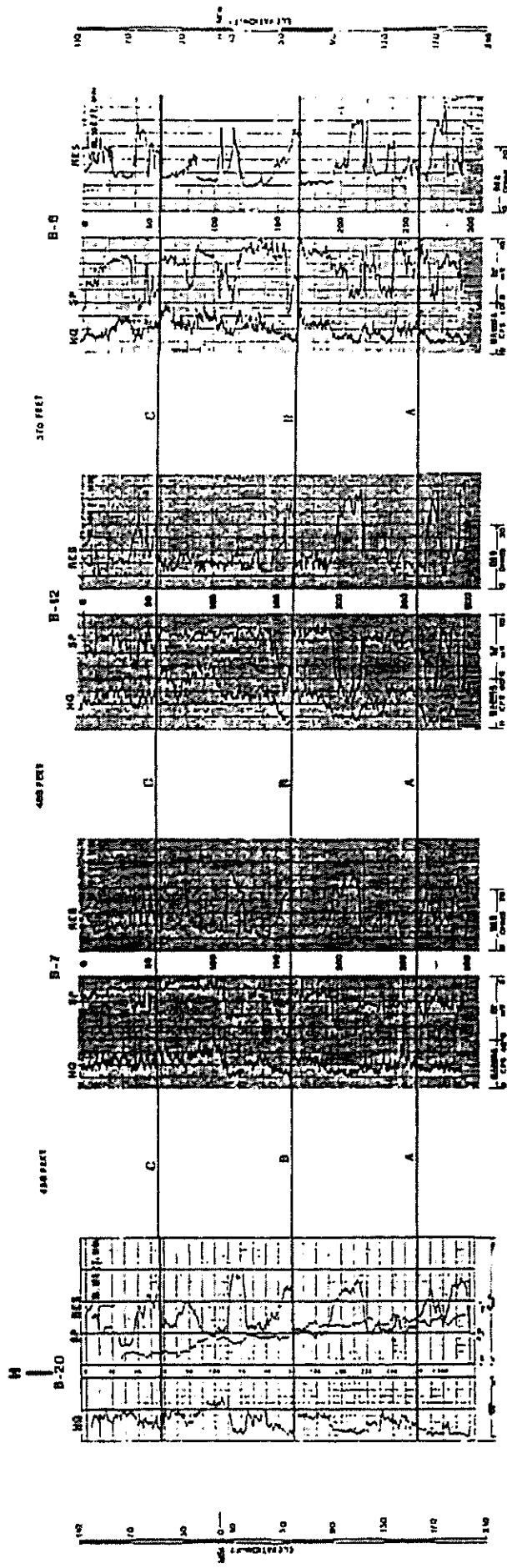
HAWTHORN PARK RECLAMATION PROJECT AND RECYCLING CENTER
 HARRIS COUNTY, TEXAS

SANIFRA OF TEXAS, INC.
 HOUSTON, TEXAS

McBride-Ratcliff and Associates, Inc.
 Geotechnical Consultants
 16000 N. Loop E., Suite 1100
 Houston, Texas 77060

DATE: 1/17/81
 BY: VJH/BB
 SCALE: 1" = 100' (VERTICAL)
 1" = 100' (HORIZONTAL)

CROSS-SECTIONS F-F & G-G' D-14



- LEGEND:**
- NG : NATURAL GAMMA RAY
 - SP : SPONTANEOUS POTENTIAL
 - RES : SINGLE POINT RESISTANCE
 - A, B, C : DESIGNATES CROSS SECTION
 - : DESIGNATES INTERPRET
 - : MARKER DEPTH

HAWTHORN PARK RECLAMATION PROJECT AND
RECYCLING CENTER
HARRIS COUNTY TEXAS

SANFILL OF TEXAS, INC
HOUSTON TEXAS

McBride-Ratliff and Associates, Inc
Geotechnical Consultants
Houston, Texas

SCALE	DATE	BY	NO.
1" = 50'	11/11/83	WJ	11-15
NOTED	DATE	BY	NO.
OK	11/11/83	WJ	11-15
CROSS-SECTION H-I'			D-15

MCBRIDE RATCLIFF ASSOCIATES
1987

LOG OF BORING

PROJECT: West Belt Landfill
Harris County

BORING NO. CB-20
FILE NO. 87-028
DATE 3-9-87

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev. 97'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 18 FEET WASH BORED 18 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %
								Liquid	Plastic	Plasticity Index	
										FREE WATER ENCOUNTERED YES NO AT FT. DEPTH. WATER AT FT. AFTER Borehole caved @ 14.2'	
										DESCRIPTION OF STRATUM	
	1.75									Stiff tan SANDY CLAY (CL) w/calcareous nodules & sand pockets -very stiff @ 2'	
	2.5		20								
	5		2.0								
	3.25		13				35	15	20	-gray w/ferrous nodules @ 7' -hard @ 8'	
	4.0										
	10									-w/organic material @ 12'	
	15	N=16								Firm light gray FINE SAND (SP) -w/clay pockets @ 18'	
	20	N=27									
	25	N=32							11	-dense light gray & tan @ 23'	
	39	N=30								-tan @ 28'	
	35	N=55								-very dense w/ferrous nodules @ 33'	
	40	4,5+	17				42	19	23	Hard brown & light gray SILTY CLAY (CL) w/silt pockets, ferrous nodules, slickensides & claystones	

* SLICKENSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT)
() CONFINING PRESSURE, PSI TSF - POCKET PENETROMETER OR TORVANE
G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-35

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-20
 FILE NO. 87-028
 DATE 3-9-87

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED	TO	FEET				
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET		
								Liquid	Plastic	Plasticity Index	Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED		YES	NO
												LL	PL	PI	AT
DESCRIPTION OF STRATUM															
[Hatched pattern]	45	4.5+											Hard brown CLAY (CH) w/sand seams & pockets		
	50	4.5+												-w/calcareous nodules & sand partings @ 50'	
[Dotted pattern]	55												Very dense brown SILTY FINE SAND (SM) w/clay seams & sand pockets		
[Cross-hatched pattern]	60	N=63										28	tan & brown @ 58'		
[Hatched pattern]	65	4.5+	28					66	28	38			Hard red CLAY (CH) w/slickensides		
	70	4.5+	23												
[Hatched pattern]	75	3.25	19					44	18	26			Very stiff gray & tan SILTY CLAY (CL) w/sand pockets		
	80	4.0	19					37	17	20			-hard, brown & tan w/sand seams @ 78'		

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-36

LOG OF BORING

PROJECT: West Belt Landfill
Harris County

BORING NO. CB-20
FILE NO. 87-028
DATE 3-9-87

CLIENT: West Belt Development, Inc.
Houston, Texas

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED	TO	FEET				
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET		
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED			YES	NO
											LL	PL	PI	AT	FT. DEPTH.
DESCRIPTION OF STRATUM															
	85	N=43	21												
	90	N=33	22												
	95	4.5+	22												
	100	4.5+													
Bottom @ 100'															

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-37

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County
 CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-21
 FILE NO. 87-028
 DATE 3-5-87

Approx. Elev. 106'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						Minus No. 200 Sieve - %	DRY AUGERED 0 TO 33 FEET WASH BORED 33 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid		Plastic		Plasticity Index
							LL	PL	PI		WATER AT 17.4 FT. AFTER 10 min.	
											DESCRIPTION OF STRATUM	
	4.5+										Hard tan & light gray SANDY CLAY (CL) w/sand pockets -stiff @ 2'	
	1.5		16				27	15	12		-very stiff, red & light gray w/ slickensides @ 4'	
	5		3.25								-hard, tan & light gray @ 6'	
	4.5+		16									
	4.5+											
	10											
	2.5		25								Very stiff red & light gray CLAY (CH) w/slickensides, ferrous & calcareous nodules	
	15											
	4.5+		18				35	20	15		Hard red grey SILTY CLAY (CL)	
	20											
	4.5+										Hard red & light gray CLAY (CH) w/slickensides & calcareous nodules	
	25											
	4.5+		23				61	25	36		-w/claystones @ 28'	
	30										Very dense red SANDY SILT (ML)	
											Very dense red SILTY FINE SAND (SM)	
		N=50										
	35											
		N=24									Firm red SANDY SILT (ML) w/clay partings	
	40											

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-38

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County
 CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-21
 FILE NO. 87-028
 DATE 3-9-87

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 33 FEET WASH BORED 33 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %
								Liquid	Plastic	Plasticity Index	
										FREE WATER ENCOUNTERED <u>YES</u> NO	
										AT 31 FT. DEPTH.	
										WATER AT 17.4 FT. AFTER 10 min.	
										DESCRIPTION OF STRATUM	
										Firm red SILT (MH)	
										-w/clay layer @ 45'	
										Dense red SILTY FINE SAND (SM)	
										w/clay partings	
										Very stiff red CLAY (CH)	
										w/slickensides	
										-hard w/silt pockets & layers @ 58'	
										-gray & very stiff @ 63'	
										-hard & tan w/calcareous nodules & sand pockets @ 68'	
										Hard red SILTY CLAY (CL)	
										w/silt pockets & layers	
										-w/clayey silt layer @ 78' to 80'	

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

• PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-39

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-21
 FILE NO. 87-028
 DATE 3-9-87

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						Minus No. 200 Sieve - %	DRY AUGERED 0 TO 33 FEET WASH BORED 33 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS				
								Liquid			Plastic	Plasticity Index
									FREE WATER ENCOUNTERED YES NO AT 31 FT. DEPTH. WATER AT 17.4 FT. AFTER 10 min.			
	DESCRIPTION OF STRATUM											
									Hard red CLAY (CH) -w/slickensides @ 83'			
									-reddish brown w/silt laminations @ 93'			
									-very stiff brown @ 98'			
									Bottom @ 100'			

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-40

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County
 CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-22
 FILE NO. 87-028
 DATE 3-9-87

Approx. Elev. 106'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 15 FEET WASH BORED 15 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %
								Liquid	Plastic	Plasticity Index	
										FREE WATER ENCOUNTERED <u>YES</u> NO	
										AT 12 FT. DEPTH. WATER AT 6.5 FT. AFTER 30 min.	
										DESCRIPTION OF STRATUM	
	2.00									Very stiff dark gray SANDY CLAY "FILL" w/roots & sand pockets	
	2.25										
	5		2.0	17						Very stiff gray SANDY CLAY (CL) w/calcareous & ferrous nodules -stiff @ 6' -light gray, tan @ 8'	
	1.25										
	1.25		22				42	15	27		
	10									medium, gray & brown, slightly sandy w/silt seams	
	1.0										
	15									-hard w/calcareous nodules & slickensides @ 18'	
	4.0		19				46	18	28		
	20										
	3.5									-very stiff w/sandy clay pockets @ 23'	
	25										
	4.5+									-hard & slightly sandy @ 27'	
	30										
	4.5+									Hard red CLAY (CH) w/calcareous nodules & slickensides	
	35										
	4.5+									-red & light gray @ 38'	
	40										

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-41

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County
 CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-22
 FILE NO. 87-028
 DATE 3-9-87

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 15 FEET		WASH BORED 15 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO
								Liquid	Plastic	Plasticity Index		
												AT 12 FT. DEPTH.
												WATER AT 6.5 FT. AFTER 30 min.
												DESCRIPTION OF STRATUM
												Hard red & light gray CLAY (CH)
												Very dense red SILT (MH) w/sand & clay partings
	45	N=66										
	50	N=21	25					30	17	13		Medium brown VERY SILTY CLAY (CL) w/clay & silt partings
	55	N=20										
	60	N=26	23					28	21	7		-w/sand & silt layers @ 58'
	65	4.5+	28					65	27	38		Hard red CLAY (CH) w/silty sand layer
	70	4.5+	22									-brown w/slickensides & calcareous nodules @ 68'
	75	4.5+										-light gray & brown w/ferrous nodules @ 73'
	80	1.0	26					49	20	29		-slightly silty @ 78' -w/silt pockets & clay pockets

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

Penetration Resistance
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-42

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-22
FILE NO. 87-028
DATE 3-9-87

CLIENT: West Belt Development, Inc.
Houston, Texas

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						Minus No. 200 Sieve - %	DRY AUGERED 0 TO 15 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED 15 TO 100 FEET	
								Liquid		Plastic	Plasticity Index	FREE WATER ENCOUNTERED
												LL
											AT 12 FT. DEPTH.	
											WATER AT 6.5 FT. AFTER 30 min.	
										DESCRIPTION OF STRATUM		
										Hard brown & light gray CLAY (CH)		
	85			22				36	17	13	Medium gray & red VERY SILTY CLAY (CL) w/clay pockets	
	90	4.5+									Hard red CLAY (CH) w/silt pockets	
	95	4.25	26					72	26	46		
											-w/slickensides @ 98'	
	100	4.5+									Bottom @ 100'	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

• PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

III-4B-43

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-23
FILE NO. 87-028
DATE 9-1-87

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev. +103.5'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 5 FEET WASH BORED 5 TO 100 FEET				
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT FT. DEPTH.	
												LL	PL
DESCRIPTION OF STRATUM													
			0.75	16								Dense tan & gray CLAYEY SAND "FILL" w/roots, shell, gravel & concrete pieces	
			1.50	15								Stiff tan & gray SANDY CLAY "FILL"	
			4.50	15				37	16	21		Hard tan & light gray SANDY CLAY (CL) -w/sand layers @ 12'	
			2.75	25								Stiff light gray & red CLAY (CH)	
			3.50	16								Very stiff tan & light gray SILTY CLAY (CL)	
			4.50	16				52	20	32		Hard tan & light gray CLAY (CH) w/silt pockets -light gray & red w/claystones @ 28'	
			4.50	23									
			4.50	22									
			4.50	17								-light gray & tan w/calcareous nodules @ 38'	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-44

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-23
 FILE NO. 87-028
 DATE 9-1-87

Approx. Elev. +103.5' Page 2 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 5 FEET WASH BORED 5 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (IN) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT FT. DEPTH.	
								LL	PL	PI		WATER AT	FT. AFTER
DESCRIPTION OF STRATUM													
													Hard light gray & tan CLAY (CH)
													Firm tan SILTY SAND (SM) w/silty clay layers
	45	N=19											
	50		0.50	27									-w/clay layers @ 50'
	55	N=21									21		
													Firm tan CLAYEY SILT (ML)
	60		0.75	26									Medium red CLAY (CH) w/sand pockets
													-stiff @ 63'
	65		2.75	31				65	27	38			
													Firm tan VERY SILTY SAND (SM)
	70		2.00	24									Stiff light gray & red CLAY (CH) w/sand layers
													Very dense reddish brown VERY SILTY SAND (SM)
	75	50/6"											
													-w/sandstones & clay layers @ 78.5'
	80	N=50									18		

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

IN) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-45

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-23
FILE NO. 87-028
DATE 9-1-87

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev. 103.5' Page 3 of 3

FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 5 FEET WASH BORED 5 TO 100 FEET			
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	
								Liquid	Plastic	Plasticity Index		
												LL
												FREE WATER ENCOUNTERED YES NO AT FT. DEPTH. WATER AT FT. AFTER
DESCRIPTION OF STRATUM												
												Very dense reddish brown VERY SILTY SAND (SM) w/sandstones
	85	N=50										
	90	N=50										
	95	4.50	23									Hard reddish brown CLAY (CH) -w/silt pockets & layers @ 98'
	100	4.50	27									Bottom @ 100'

* SLICKENSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT)
() CONFINING PRESSURE, PSI TSF - POCKET PENETROMETER OR TORVANE
G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-46

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-24
 FILE NO. 87-028
 DATE 9-1-87

Approx. Elev. +104:0'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 5 FEET		WASH BORED 5 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												FT. DEPTH.	
LL	PL	PI	WATER AT										
DESCRIPTION OF STRATUM													
			1.50	14								Stiff tan & gray CLAY "FILL" w/shell, roots & brick fragments -tan & dark gray w/organic matter @ 3'	
			1.75	17								Firm tan & gray CLAYEY SAND "FILL" w/shell & roots	
			4.50	14				38	15	23		Hard light gray & tan SANDY CLAY (CL) w/sand pockets	
			0.50	15								Firm light gray & tan CLAYEY SAND (SC) w/sand pockets	
			N=34									Dense light gray & tan SAND (SP)	
			N=70								9	-very dense, light gray @ 23.5'	
			N=77									-light gray & tan @ 28.5'	
			4.50	27								Hard light gray & red CLAY (CH)	
			4.50	20								-w/silt pockets & layers @ 38'	

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-47

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-24

FILE NO. 87-028

CLIENT: West Belt Development, Inc.
Houston, Texas

DATE 9-1-87

Approx. Elev. +104.0' Page 2 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 5 FEET		WASH BORED 5 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO	AT FT. DEPTH.	
								Liquid	Plastic	Plasticity Index			WATER AT FT. AFTER
DESCRIPTION OF STRATUM													
												Hard light gray & red CLAY (CH)	
												-w/claystones & slickensides @ 43'	
												Very dense light gray SAND (SP)	
												-light gray & tan @ 53.5'	
												Hard red CLAY (CH)	
												w/sand pockets	
												Hard gray & brown SLIGHTLY SILTY CLAY (CL)	
												Very stiff gray & reddish brown CLAY (CH)	
												-tan & gray w/sand seams @ 78'	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-48


LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-24
FILE NO. 87-028
DATE 9-1-87

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev. +104.0' Page 3 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 5 FEET WASH BORED 5 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Div Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO AT FT. DEPTH. WATER AT FT. AFTER
								Liquid	Plastic	Plasticity Index		
DESCRIPTION OF STRATUM												
	85	4.25	23									Very stiff gray & reddish brown CLAY (CH) -w/silt pockets & stones @ 83'
	90	3.75	24									Dense reddish brown CLAYEY SILT (ML) w/clay pockets
	95	4.50	22									Hard gray & reddish brown CLAY (CH) w/silt pockets
	100	4.50	25									Bottom @ 100'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

ATTERBERG LIMITS
PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-25
 FILE NO. 87-028
 DATE 9-4-87

Approx. Elev. +102.5'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 5 FEET		WASH BORED 5 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								LL	PL	PI		AT	
												FT. DEPTH.	
WATER AT		FT. AFTER											
DESCRIPTION OF STRATUM													
												Firm brown VERY SILTY SAND (SM)	
	5											Dense dark gray CLAYEY SAND (SC) w/roots	
	10		4.50	12				38	18	20		Hard tan & light gray VERY SANDY CLAY (CL)	
	15		N=25									Firm tan & light gray FINE SAND (SP)	
	20		N=23								14	Firm light gray SILTY SAND (SM)	
	25		N=44								4	Dense light gray SAND (SP) w/clay seams -firm @ 28.5'	
	30		N=26										
	35		N=69									Very dense light brown SILTY SAND (SM)	
	40		N=69										

* SLICKSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-25
FILE NO. 87-028
DATE 9-4-87

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev. +102.5' Page 2 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 5 FEET WASH BORED 5 TO 100 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO AT FT. DEPTH. WATER AT FT. AFTER	
								Liquid	Plastic	Plasticity Index		
												LL
DESCRIPTION OF STRATUM												
											Very dense light brown SILTY SAND (SM) -firm, reddish brown w/clay layers @ 43.5'	
				24							Stiff red CLAY (CH) w/sand pockets & layers & calcareous nodules	
				23							Firm reddish brown FINE SAND (SP) w/clay pockets & layers -very dense tan & light gray @ 58.5'	
									9			
				3.50	25				52	23	29	Very stiff gray & reddish brown CLAY (CH) w/slickensides, silt seams & pockets
				4.50	21							Hard tan & gray SILTY CLAY (CL) w/ferrous nodules -gray & reddish brown w/clay & sand pockets @ 78'
				4.50	19							

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-51

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-25
 FILE NO. 87-028
 DATE 9-6-87

Approx. Elev. +102.5' Page 3 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 5 FEET WASH BORED 10 TO 100 FEET				
	DEPTH (feet)	SAMPLES	Penetration Resistance INI or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED	YES	NO	
								Liquid	Plastic	Plasticity Index		AT	FT. DEPTH.	WATER AT	FT. AFTER
												LL	PL	PI	DESCRIPTION OF STRATUM
	85	2.50	25										Stiff reddish brown SILTY CLAY (CL) -w/siltstones @ 83'		
	90	4.50	23					62	23	39			Hard reddish brown CLAY (CH) w/slickensides, silt streaks & pockets		
	95	4.50	22										-w/silt layers @ 98'		
	100	4.50	23										Bottom @ 100'		

* SLICKENSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT)
 () CONFINING PRESSURE, PSI () TSF - POCKET PENETROMETER OR TORVANE
 G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-52

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-26
 FILE NO. 87-028
 DATE 9-6-87
 Approx. Elev. +88.2

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 10 FEET		WASH BORED 10 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO
								Liquid	Plastic	Plasticity Index		
								LL	PL	PI		
DESCRIPTION OF STRATUM												
	0										Dense tan & light gray CLAYEY SAND "FILL" w/clay pockets	
	5										Firm light brown FINE SAND (SP) -w/clay layers & pockets @ 3'	
	10	N=11								5	-light gray & tan @ 8.5'	
	15	N=10									Loose reddish brown VERY SILTY SAND (SM)	
	20	N=5									-reddish brown @ 18.5'	
	25	N=28									-firm @ 23'	
	30	N=25								10	Firm light gray & tan FINE SAND (SP) w/clay seams	
	35	N=34									-dense @ 33.5'	
	40	N=29								11	-firm @ 38.5'	

* SLICKSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT)
 () CONFINING PRESSURE, PSI TSF - POCKET PENETROMETER OR TORVANE
 G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-53

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-26
 FILE NO. 87-028
 DATE 9-6-87

Approx. Elev. +88.2' Page 2 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 10 FEET		WASH BORED 10 TO 100 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED	YES	NO		
								Liquid	Plastic	Plasticity Index				AT	FT. DEPTH.
DESCRIPTION OF STRATUM															
													Firm reddish brown VERY SILTY SAND (SM)		
	45	N=19													
	50	N=28	42				54	24	30				Medium brownish red CLAY (CH) w/silt layers		
	55	N=37										38	Dense reddish brown VERY SILTY SAND (SM) w/silty clay layers		
	60	N=42													
	65	N=13	20				43	19	24				Very stiff reddish brown SILTY CLAY (CL) w/silt layers		
	70		24										-gray & brown w/sand pockets & layers & organic materials @ 68'		
	75	N=60											Very dense light gray FINE SAND (SP)		
	80	4.5+	20										Hard reddish brown & gray CLAY (CH) w/silt pockets & slickensides		

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-54

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-26
 FILE NO. 87-028
 DATE 9-6-87

Approx. Elev. +88.2' Page 3 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 10 FEET		WASH BORED 10 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	FT. DEPTH.
DESCRIPTION OF STRATUM													
	85	4.00	30									Hard reddish brown & gray CLAY (CH) w/silt pockets & slickensides	
	90	1.75	19									Stiff gray SILTY CLAY (CL) w/silt pockets	
	95	2.75	14 14									Stiff gray & tan SANDY CLAY (CL) w/sand pockets & streaks	
	100	4.50	22									Hard tan & gray CLAY (CH) w/silt pockets & slickensides	
												Bottom @ 100'	

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

FI-4B-55

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-27
 FILE NO. 87-028
 DATE 10-16-87

Approx. Elev. +105.0'

SOIL SYMBOL	DEPTH (feet)	SAMPLES	FIELD DATA		LABORATORY DATA						Minus No. 200 Sieve - %	DRY AUGERED 0 TO 25 FEET WASH BORED 25 TO 100 FEET
			Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS				
								Liquid	Plastic	Plasticity Index		
												FREE WATER ENCOUNTERED <u>YES</u> NO
												AT 22.0 FT. DEPTH. WATER AT ** FT. AFTER 5 minutes **Borehole walls collapsed @ 21.5'
DESCRIPTION OF STRATUM												
	7											Hard gray & tan CLAY "FILL" w/sand pockets & calcareous nodules
	5	4.50	15									
	10	2.25	15									Stiff gray & tan SANDY CLAY (CL) w/ferrous nodules & sand streaks
	15	N=25									24	Firm light gray & tan SILTY SAND (SM)
	20	N=26										Firm light gray & tan SAND (SP)
	25	N=20									5	
	30											
	35											
	40											

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-56

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-27
 FILE NO. 87-028
 DATE 10-16-87

Approx. Elev. +105.0' Page 2 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA								DRY AUGERED 0 TO 25 FEET		WASH BORED 25 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED			
								Liquid	Plastic	Plasticity Index		YES	NO		
								LL	PL			PI	AT 22.0 FT. DEPTH.		
WATER AT ** FT. AFTER 5 minutes **Boring walls collapsed @ 21.5'															
DESCRIPTION OF STRATUM															
-														Firm light gray & tan SAND (SP)	
-	45														
-	50														
-	55														
-	60	4.50												Hard red CLAY (CH) w/slickensides & silty sand layers & inbeds -very stiff, gray & red @ 63'	
-	65	4.25	26				65	25	40					-w/calcareous nodules @ 68'	
-	70	3.00	27											-hard @ 73'	
-	75	4.50	18												
-	80	4.50	19				37	19	18					Hard gray & brown SANDY CLAY (CL) w/sand pockets	

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

UNDER PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-57

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-27
FILE NO. 87-028
DATE 10-16-87

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev. +105.0' Page 3 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						Minus No. 200 Sieve - %	DRY AUGERED 0 TO 25 FEET WASH BORED 25 TO 100 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO		
								Liquid		Plastic		Plasticity Index	AT 22.0 FT. DEPTH.
										WATER AT ** FT. AFTER 5 minutes **Boreing walls collapsed @ 21.5'			
										DESCRIPTION OF STRATUM			
										Hard gray & brown SILTY CLAY (CL) w/silt pockets			
	85	4.50	21							Hard gray & brown CLAY (CH)			
										-w/silt pockets @ 88'-95'			
	90	4.50	22				57	22	35	-red @ 93'			
										-light gray & red @ 98'			
	95	4.50	23										
	100	4.50	31							Bottom @ 100'			

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-58

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. WB-28
FILE NO. 87-028
DATE 10-16-87

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev. +105.0' Page 1 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 8 FEET WASH BORED 8 TO 100 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												FT. DEPTH.	
LL	PL	PI	WATER AT		FT. AFTER								
DESCRIPTION OF STRATUM													
													Gray & tan CLAY "FILL"
	5												
	10												Light gray & tan SANDY CLAY (CL)
	15												Light gray & tan SAND (SP)
	20												
	25												
	30												
	35												
	40												-w/clay inbeds & calcareous nodules @ 38'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

III-4B-59

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. WB-28
 FILE NO. 87-028
 DATE 10-16-87
 Page 2 of 3

Approx. Elev. +105.0'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 8 FEET		WASH BORED 8 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO	AT FT. DEPTH.	
								Liquid	Plastic	Plasticity Index			WATER AT FT. AFTER
DESCRIPTION OF STRATUM													
												Light gray & tan SAND (SP) w/clay inbeds & calcareous nodules	
												Red & gray CLAY (CH)	
												Gray SANDY CLAY (CL)	

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-60

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. WB-28
FILE NO. 87-028
DATE 10-16-87

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev. +105.0' Page 3 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 8 FEET WASH BORED 8 TO 100 FEET				
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO		
								Liquid	Plastic	Plasticity Index		AT		
												FT. DEPTH.		
LL	PL	PI	WATER AT			FT. AFTER								
DESCRIPTION OF STRATUM														
														Red & gray SANDY CLAY (CL)
	85													Red & gray SILTY CLAY (CL) -w/silt inbeds @ 84'-87'
	90													-red @ 90'
	95													
	100													Bottom @ 100'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-61

MCBRIDE RATCLIFF ASSOCIATES
1986

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-1
FILE NO. 87-028
DATE 2/13/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 104'

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 27 FEET		WASH BORED 27 TO 80 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid	Plastic	Plasticity Index		AT 26.5 FT. DEPTH.	
												LL	PL
DESCRIPTION OF STRATUM													
[Diagonal Hatching]	1.25											Stiff dark gray SANDY CLAY (CL) -w/roots to 2'	
	2.0											-tan & light gray below 4' -ferrous & calcareous deposits @ 4-10'	
	5 - 3.25		15					39	16	23			
	2.5												
	2.75												
	10 - 3.0		21										-very stiff below 13'
[Dotted Hatching]	15 - 4.5+		16					43	17	26		-sand pockets & calcareous deposits below 18'	
	20 -												
	25 -											Very dense tan & light gray SILTY FINE -w/calcareous nodules SAND (SM) -tan & red below 29'	
[Cross-hatching]	30 -	N=52											
	35 -	N=50 6"											
	40 -	N=50 6"											

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-62

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

CLIENT: West Belt Development, Inc.
Houston, Texas

BORING NO. CB-1
FILE NO. 87-028
DATE 2/13/86

Approx. Elev: 104' Page 2 of 2

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 27 FEET		WASH BORED 27 TO 80 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO		
								Liquid	Plastic	Plasticity Index		AT FT. DEPTH.		
								LL	PL	PI		WATER AT	FT. AFTER	
DESCRIPTION OF STRATUM														
													Very dense tan & red SILTY FINE SAND (SM)	
	45	X	N=50 4"									6		
	50	X	N=50 4"											
	55	X	N=50 5"										-clay pockets below 54'	
	60	X	N=58											
	65		4.5	25				57	24	33			Hard reddish brown CLAY (CH) -w/calcareous nodules	
	70		4.5+	20				43	18	25			Hard reddish brown & light gray SILTY CLAY (CL) w/calcareous nodules	
	75		3.0	20				34	19	15	91			
	80		4.5+	19				50	21	29			w/claystone	

Time (min)	Depth (ft)
0	26.5
5	22.7
10	18.8
15	17.3
20	16.3
25	15.8
30	15.4

* SLICKENSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT)
() CONFINING PRESSURE, PSI TSF - POCKET PENETROMETER OR TORVANE
G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

III-4B-63

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-2
FILE NO. 87-028
DATE 2/12/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 104'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 26 FEET		WASH BORED 26 TO 80 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO	AT 25 FT. DEPTH.
								Liquid	Plastic	Plasticity Index		
							LL	PL	PI	Minus No. 200 Sieve - %	WATER AT ** FT. AFTER **Caved in @ 22.3' After 5 minutes	DESCRIPTION OF STRATUM
	1.25											Stiff brown & gray CLAY (CH) "FILL"
	2.5		22				53	18	35	79		Stiff dark gray SANDY CLAY (CL) -w/clay pockets @ 2-4' -tan & gray @ 4' -very stiff, tan & light gray, w/ calcareous deposits @ 6'
	1.75											
	3.0											
	3.75											
	10											
	2.75		16				31	15	16			-clay pockets @ 13-15' -clayey sand layer @ 15' -sand pockets @ 18-20'
	20		14									
	25	N= 50 6"										Very dense tan & light gray SILTY SAND (SM) -slightly clayey @ 22-25' -w/sandstone layers @ 24-35'
	30	N=59								27		
	35	N= 50 5"										
	40	N= 50 6"										-tan & brown @ 39'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

ATTERBERG LIMITS
PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-64

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-2
 FILE NO. 87-028
 DATE 2-12-86

Approx. Elev: 104'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 26 FEET		WASH BORED 26 TO 80 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO		
								Liquid	Plastic	Plasticity Index			AT	FT. DEPTH.
DESCRIPTION OF STRATUM														
												Very dense tan & brown SILTY SAND (SM)		
	45	X	N=50 6"											
	50	X	N=80 11"											
	55	X	N=34											
	60		4.25					44	22	22		Very stiff brown SILTY CLAY (CL)		
	65	X	N=21 N=26	30 29								Very stiff red CLAY (CH) w/silt pockets		
	70	X	N=18	21				39	16	23		Very stiff tan & gray SILTY CLAY (CL)		
	75		3.5	26				53	21	32		Very stiff gray & red CLAY (CH) w/calcareous deposits & sandy clay streaks		
	80		4.25	18				54	22	32				

* SLICKSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE Bottom @ 80'
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-65

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-3
FILE NO. 87-028
DATE 2/12/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 104'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 40 FEET		WASH BORED 40 TO 80 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid	Plastic	Plasticity Index			
							LL	PL	PI				
												AT 36.5 FT. DEPTH.	
												WATER AT 30.3 FT. AFTER 25 minutes	
												DESCRIPTION OF STRATUM	
		2.5										Stiff tan & dark gray SANDY CLAY (CL) w/calcareous & ferrous deposits -hard @ 2'	
		4.5+	14									-tan & light gray @ 4'	
		5	4.5+									-very stiff @ 6'	
		3.25	15									-slightly sandy @ 8'	
		3.25	16					47	17	30			
		10											
		2.5	29					66	23	43			Stiff red, tan & light gray CLAY (CH) w/calcareous nodules & slickensides
	15												
	4.5+	14										Hard red tan & light gray SANDY CLAY (CL) w/sand pockets & streaks & ferrous nodules	
	20												
	4.5+	20					44	19	25			Hard red, tan, & gray SILTY CLAY (CL) w/clay pockets	
	25												
	4.25	26										Hard red & gray CLAY (CH) w/silt pockets & sand layers	
	30												
	4.5+	23					63	25	38			-w/calcareous nodules & claystones @ 33'	
	35												
	4.0											-very stiff @ 38'	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT III-4B-66

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-3
 FILE NO. 87-028
 DATE 2/12/86

Approx. Elev: 104' Page 2 of 2

FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 40 FEET		WASH BORED 40 TO 80 FEET	
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT FT. DEPTH.	
												LL	PL
DESCRIPTION OF STRATUM													
	45	50 5"											Very dense red & brown SILTY FINE SAND (SM)
	50	50 5.5"											-w/siltstones @ 43'
	55	N=34											-dense, very silty @ 53'
	60	N=25	27										Very stiff gray & red SILTY CLAY (CL) w/slickensides & calcareous nodules
	65	3.0	25				58	22	36	85			-red w/silt layers & pockets @ 63'
	70	4.5+	20				50	19	31				-hard @ 68' w/calcareous nodules @ 68'
	75	4.5+	21				45	19	26				-tan & brown @ 73'
	80	4.5+	21										-w/silt pockets @ 78'

Time (min)	Depth (ft)
0	36.5
5	36.1
10	35.0
15	34.0
20	31.8
25	30.3

* SLICKENSIDED FAILURE (N) - CONFINING PRESSURE, PSI G.S. GRAIN SIZE

PN - PENETRATION RESISTANCE Bottom @ 80'
 SPT - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

III-4B-67

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-4
FILE NO. 87-028
DATE 2/11/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 102'

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 25 FEET		WASH BORED 25 TO 80 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED <u>YES</u> NO		
								Liquid	Plastic	Plasticity Index		AT 23.0 FT. DEPTH.		
												LL	PL	PI
DESCRIPTION OF STRATUM														
													SHELL & LIMESTONE "FILL"	
	1.25												Medium dark gray SANDY CLAY (CL) w/calcareous nodules -stiff, gray @ 4'	
	2.0												-tan & light gray w/ferrous nodules @ 6'	
	2.25		13					31	15	16			-very stiff @ 8'	
	3.5		16											
	10													
	3.5		23					62	22	40			Very stiff red, brown & light gray CLAY (CH) w/slickensides, claystones & calcareous nodules	
	15													
	4.25		15										Very stiff tan & gray SANDY CLAY (CL) w/ferrous & calcareous nodules	
	20													
	4.5+		20										Hard red, brown & light gray CLAY (CH) w/calcareous nodules & slickensides	
	25													
	4.5+		18					46	19	27			Hard gray & red SILTY CLAY (CL) w/silt pockets	
	30													
	4.5+		20										Hard gray & red CLAY (CH) w/silt pockets & slickensides	
	35													
	4.5+		18					62	22	40	97		-w/calcareous nodules & claystones @ 38'	
	40													

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT III-4B-68

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-4
 FILE NO. 87-028
 DATE 2/11/86

Approx. Elev: 102'

Page 2 of 2

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 25 FEET WASH BORED 25 TO 80 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO AT FT. DEPTH. WATER AT FT. AFTER
								Liquid	Plastic	Plasticity Index		
DESCRIPTION OF STRATUM												
												Hard gray & red CLAY (CH) w/sand layers
	45	50 4"										Very dense red SILTY FINE SAND (SM)
												Stiff red CLAY (CH)
	50											Firm red CLAYEY SILT (ML) w/silty sand layers & siltstones
	55	N=28								99		
	60	N=24	24									Stiff brown CLAY (CH) very stiff w/silty clay & silt pockets & slickensides @ 63'
	65	3.75	27				51	21	30			
	70	4.25	24									
	75	4.5+	22									-hard w/ferrous & calcareous nodules @ 73'
	80	4.0	19									-very stiff w/ claystones @ 78'

Time (min)	Depth (ft)
0	23.0
5	22.0
10	21.8

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

• PENETRATION RESISTANCE Bottom @ 80'
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-69

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-5
FILE NO. 87-028
DATE 11/16/85

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 103'

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 28 FEET		WASH BORED 28 TO 67 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED <u>YES</u> NO		
								Liquid	Plastic	Plasticity Index		AT 26.0 FT. DEPTH.		
												LL	PL	PI
DESCRIPTION OF STRATUM														
													Stiff light gray SANDY CLAY "FILL" -w/shell & rock fragments	
			4.25										Very stiff dark gray SANDY CLAY (CL)	
	5		3.25	9									Dense tan & gray CLAYEY SAND (SC) w/sand pockets	
			2.25	11				23	14	9	44			
	10		2.75	13									Very stiff tan & gray SANDY CLAY (CL) w/sand pockets, ferrous nodules & shells	
	15	X	N=23										Firm light gray SILTY FINE SAND (SM)	
	20		1.75	20				35	17	18			Stiff tan & light gray SANDY CLAY (CL) w/clay pockets	
													-hard w/sand pockets @ 23'	
	25		4.5+	14										
	30		4.5+	19									Dense red & gray CLAYEY SILT (ML) w/clay pockets	
		X	N=24	24									Stiff gray & red SILTY CLAY (CL) w/silt pockets	
	35		4.5+	22				60	24	36			Hard gray & red CLAY (CH) w/calcareous nodules & slickensides	
													Hard red SILTY CLAY (CL)	
	40		4.5+	19										

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-70

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-5
 FILE NO. 87-028
 DATE 11/16/85

Approx. Elev: 103'

Page 2 of 2

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 28 FEET		WASH BORED 28 TO 67 FEET		
	DEPTH (feet)	SAMPLFS	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO	AT FT. DEPTH.	
								Liquid	Plastic	Plasticity Index			WATER AT FT. AFTER
DESCRIPTION OF STRATUM													
			N=48							94	Dense red CLAYEY SILT (ML) w/sandy silt layers -very dense @ 43.5'		
	45	X	90 9"										
	50	X	N=25	31				53	22	31	Very stiff red CLAY (CH)		
	55	X	N=33								Dense red SANDY SILT (ML)		
	60	X	N=26								Very stiff red CLAY (CH) w/silt layers		
	65	X	4.5+	27				69	26	43	Firm red & brown CLAYEY SILT (ML) Hard gray & red CLAY (CH) w/silt pockets		
	70										Bottom @ 67'		
	75												

Water Level Readings

Time (min)	Depth (ft)
0	26.0
5	24.1
10	22.2
15	21.2
20	20.1
25	19.2
30	18.3

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE Bottom @ 80'
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-71

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-6
FILE NO. 87-028
DATE 2/11/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 102'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 22 FEET		WASH BORED 22 TO 80 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED <u>YES</u> NO
								Liquid	Plastic	Plasticity Index		
DESCRIPTION OF STRATUM												
											Shell & Limestone "FILL"	
			3.25								Very stiff tan & light gray SANDY CLAY (CL)	
	5		4.5+	14				34	13	21	hard w/sand pockets -w/sand streaks @ 4'	
			4.5+								-very sandy & very stiff w/ferrous nodules @ 8'	
	10		3.5	15				28	16	12		
											Firm light gray FINE SAND (SP) w/clay pockets	
	15			N=30						9		
	20			N=35								
	25		4.5								Hard light gray SANDY CLAY (CL) w/slickensides & sand pockets	
	30		4.5+	18				43	18	25	80	Hard red & gray SILTY CLAY (CL) -w/silt pockets, calcareous nodules & slickensides @ 28'
	35		4.5+	21								Hard gray & red CLAY (CH) w/calcareous nodules @ slickensides
	40		4.5+	25				64	23	41		

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-72

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-6
FILE NO. 87-028
DATE 2/11/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 102' Page 2 of 2

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 22 FEET		WASH BORED 22 TO 80 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Div Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												FT. DEPTH.	FT. AFTER
LL	PL	PI	DESCRIPTION OF STRATUM										
	45	4, 5+	23										Hard red & gray CLAY (CH) w/calcareous nodules & slickensides
	50	N=91											Very dense red & brown SILTY FINE SAND (SM) w/clay layers
	55	N=60											
	60	N=33	30										Very stiff red & brown CLAY (CH) w/slickensides & silt pockets & layers -stiff w/silt & silty clay layers @ 63'
	65	2.5	30					72	23	49	97		-very stiff w/calcareous nodules @ 68'
	70	3.5	25										
	75	2.25	21					38	19	19			Stiff red & gray SILTY CLAY (CL) w/silt & clay pockets & calcareous nodules -hard, very silty w/siltstones @ 78'
	80	4.5+	19										

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE Bottom @ 80'
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-73

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-7
FILE NO. 87-028
DATE 2/26/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 104'

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 25 FEET		WASH BORED 25 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (q) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED <u>YES</u> NO	
								LL	PL	PI		AT 24.0 FT. DEPTH.	
												WATER AT 21.0 FT. AFTER 15 minutes	
DESCRIPTION OF STRATUM													
[Diagonal Hatching]	2.0	19										Very stiff dark gray SILTY CLAY (CL) w/roots -w/calcareous nodules @ 2' -tan & gray w/ferrous nodules @ 4'	
	3.75												
[Diagonal Hatching]	5	3.25	17										
[Diagonal Hatching]	1.75											Stiff gray CLAY (CH) w/calcareous nodules -tan & gray w/sand pockets @ 8'	
	10	1.75	26				51	18	33				
[Diagonal Hatching]	2.0	16										Stiff tan & gray SANDY CLAY (CL) w/ferrous nodules & sand pockets -hard @ 18' -w/calcareous nodules @ 8'	
	15												
[Diagonal Hatching]	20	4.5+	17				43	17	26				
[Diagonal Hatching]												Firm light gray VERY SILTY FINE SAND (SM) w/sandstones	
	25	N=23									41		
[Diagonal Hatching]												Dense brown FINE SAND (SP) -red & brown w/sandstones @ 33'	
	30	N=48											
[Diagonal Hatching]												-w/clay pockets @ 38'	
	35	N=48											
[Diagonal Hatching]	40	N=37											

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT III-4B-74

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-7
 FILE NO. 87-028
 DATE 2/26/86

Approx. Elev: 104' Page 2 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 25 FEET		WASH BORED 25 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												LL	PL
WATER AT		FT. AFTER		DESCRIPTION OF STRATUM									
													Very dense brown FINE SAND (SP)
	45	X	N=60										
	50	X	N=65										
	55	X	N=9										Firm brown CLAYEY SILT (ML)
	60		3.0	23				55	24	31			Very stiff gray & red CLAY (CH) w/silt pockets
	65		2.5	20				40	16	24			Very stiff red & gray SANDY CLAY (CL) w/calcareous nodules
	70		3.0	20									Very stiff gray & red CLAY (CH) w/calcareous nodules & silt pockets
	75		3.0	20									-w/sandy clay layers @ 72' -w/silt pockets & silty clay layers @ 73'
	80		3.25	20									-w/claystones & silty sand layers @ 78'

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-75

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-7
 FILE NO. 87-028
 DATE 2-26-86

Approx. Elev: 104'

Page 3 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 25 FEET		WASH BORED 25 TO 100 FEET													
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO												
								Liquid	Plastic	Plasticity Index														
	LL	PL	PI	AT		FT. DEPTH.		WATER AT		FT. AFTER														
DESCRIPTION OF STRATUM																								
												Very stiff gray & red SILTY CLAY (CL) w/clay, clayey silt & silty sand layers												
	85		2.5	20				34	19	15														
												Very stiff gray & red CLAY (CH) w/calcareous nodules												
	90		4.25	24																				
												-hard w/claystones @ 93'												
	95		4.5+	28																				
												-very stiff w/silt pockets @ 98'												
	100		4.0	31				74	23	51														
												Bottom @ 100'												
												<table border="1"> <thead> <tr> <th colspan="2">Water Level Readings</th> </tr> <tr> <th>Time(min)</th> <th>Depth(ft)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>24.0</td> </tr> <tr> <td>5</td> <td>21.5</td> </tr> <tr> <td>10</td> <td>21.3</td> </tr> <tr> <td>15</td> <td>21.0</td> </tr> </tbody> </table>	Water Level Readings		Time(min)	Depth(ft)	0	24.0	5	21.5	10	21.3	15	21.0
Water Level Readings																								
Time(min)	Depth(ft)																							
0	24.0																							
5	21.5																							
10	21.3																							
15	21.0																							

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT III-4B-76












LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-8
FILE NO. 87-028
DATE 2/26/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 103'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 25 FEET WASH BORED 25 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %
								Liquid	Plastic	Plasticity Index	
										FREE WATER ENCOUNTERED <u>YES</u> NO	
										AT 23.0 FT. DEPTH.	
										WATER AT 16.5 FT. AFTER 20 minutes	
										DESCRIPTION OF STRATUM	
	1.5									Stiff dark gray SANDY CLAY (CL) very sandy w/calcareous nodules	
	2.5									-very stiff, tan & gray w/ferrous nodules, sand pockets & streaks @ 4'	
	5		3.0	17				44	18	26	-stiff @ 8'
	3.25										
	10										
	15							29	15	14	-w/clay pockets
	20		4.5+	16							
	25							26	19	7	Dense red & gray CLAYEY SAND (SC) -w/sand layers & clay pockets @ 23'
	30	X	N=78	12							-w/sandstone layers @ 29-33'
	35							39	20	19	Very stiff red & gray SILTY CLAY (CL) w/sand pockets & calcareous nodules
	40	X	N=64								Very dense red & light gray FINE SAND (SP)

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT III-4B-77

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-8
FILE NO. 87-028
DATE _____

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 103' Page 2 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 25 FEET		WASH BORED 25 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO			
								Liquid	Plastic	Plasticity Index		AT		FT. DEPTH.	
												LL	PL	PI	WATER AT
DESCRIPTION OF STRATUM															
													Very dense light gray FINE SAND (SP)		
	45	N=53											-dense @ 48'		
	50	N=33											-very dense @ 53'		
	55	N=68													
	60	75 11.5"											-dense w/clay pockets @ 63'		
	65	N=44													
	70	3.25	19					38	15	23	84		Very stiff red & light gray SILTY CLAY -w/clay pockets & calcareous nodules @ 68' (CL)		
	75	3.25	22					30	19	11			Dense red & light gray CLAYEY SILT (ML) w/clay pockets & calcareous nodules		
	80	N=22									61		Firm red & light gray SANDY SILT (ML) w/sandstone layers		

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-78

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-8
FILE NO. 87-028
DATE 2-26-86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 103'

Page 3 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 25 FEET WASH BORED 25 TO 100 FEET																
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO														
								Liquid	Plastic	Plasticity Index		AT														
												FT. DEPTH.														
LL	PL	PI	WATER AT																							
DESCRIPTION OF STRATUM																										
				21				26	19	7		Firm gray & red CLAYEY SILT (ML) w/clay layers														
			4.5+	26				55	23	32		Hard red CLAY (CH) w/slickensides, silt layers & pockets -gray & red w/calcareous nodules @ 93'														
			4.5+	26																						
			4.5+	27								-w/silt layers @ 98'														
												Bottom @ 100'														
												<table border="1"> <thead> <tr> <th colspan="2">Water Level Readings</th> </tr> <tr> <th>Time(min)</th> <th>Depth(ft)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>23.0</td> </tr> <tr> <td>5</td> <td>20.6</td> </tr> <tr> <td>10</td> <td>18.0</td> </tr> <tr> <td>15</td> <td>17.0</td> </tr> <tr> <td>20</td> <td>16.5</td> </tr> </tbody> </table>	Water Level Readings		Time(min)	Depth(ft)	0	23.0	5	20.6	10	18.0	15	17.0	20	16.5
Water Level Readings																										
Time(min)	Depth(ft)																									
0	23.0																									
5	20.6																									
10	18.0																									
15	17.0																									
20	16.5																									

* SLICKENSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT)
() CONFINING PRESSURE, PSI TSF - POCKET PENETROMETER OR TORVANE
G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-79

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-9
FILE NO. 87-028
DATE 2/24/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 103'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 28 FEET WASH BORED 28 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No 200 Sieve - %
								Liquid	Plastic	Plasticity Index	
										FREE WATER ENCOUNTERED <u>YES</u> NO	
										AT 27.0 FT. DEPTH.	
										WATER AT 12.5 FT. AFTER 25 minutes	
										DESCRIPTION OF STRATUM	
			2.0							Stiff tan & dark gray SANDY CLAY (CL)	
			4.5+	16				51	17	34	Hard tan & dark gray CLAY (CH) w/ferrous & calcareous nodules & sand seams
	5		4.5+								
			4.5+								
			3.5	18							Very stiff tan & light gray SANDY CLAY (CL) w/ferrous & calcareous nodules -slickensides @ 11' -stiff tan & gray w/clay pockets @ 13'
	10										
			2.0	18			46	15	31		
			3.5	14							-very stiff w/sand pockets & streaks @ 18'
	20										
			3.0							91	Firm tan CLAYEY SILT (ML)
	25										
			4.5+	26							Hard gray & red CLAY (CH) w/calcareous nodules, slickensides & sandy clay layers -w/claystones @ 33'
	30										
			4.5+	19			63	24	39	100	
	35										
			4.5+	28							
	40										

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-80

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-9
 FILE NO. 87-028
 DATE 2/24/86

Approx. Elev: 103'

Page 2 of 3

FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 28 FEET WASH BORED 28 TO 100 FEET		
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			Minus No. 200 Sieve - %
								Liquid	Plastic	Plasticity Index	
								LL	PL	PI	
											FREE WATER ENCOUNTERED YES NO
											AT FT. DEPTH.
											WATER AT FT. AFTER
DESCRIPTION OF STRATUM											
											Hard red & gray SILTY CLAY (CL)
	45	N=40									Dense tan SILTY FINE SAND (SM) w/clay layers -w/clayey sand layers @ 48'
	50	N=30									
	55	4.5+	23								Hard red CLAY (CH) w/silt pockets
	60	N=30								90	Firm tan CLAYEY SILT (ML) w/sand & clay layers, sandstones & silt streaks
	65	4.5+	24				56	23	33		Hard red CLAY (CH) w/silt layers, sand pockets & slickensides
	70	3.5	21				44	19	25		Very stiff gray & brown SILTY CLAY (CL) w/calcareous nodules
	75	4.5+	22								Hard gray & brown CLAY (CH) w/calcareous nodules
	80	2.75	24								Very stiff gray & red SILTY CLAY (CL) w/clayey silt layers & sandstones

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-81

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-9
FILE NO. 87-028
DATE 2/24/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 103' Page 3 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 28 FEET		WASH BORED 28 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content % _w	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO	AT FT. DEPTH.	
								Liquid	Plastic	Plasticity Index			WATER AT FT. AFTER
DESCRIPTION OF STRATUM													
	85	4.5+	20					41	19	22	Hard red & gray SILTY CLAY (CL) w/silt pockets & layers		
	90	4.5+	26								Hard gray & red CLAY (CH) w/slickensides & silt seams & pockets		
	95	4.5+	26										
	100	4.5+	25										
											Bottom @ 100'		

Water Level Readings

Time (min)	Depth (ft)
0	27.0
5	22.5
10	17.3
15	14.0
20	13.0
25	12.5

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-82

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-10
FILE NO. 87-028
DATE 2/24/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 102'

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 25 FEET WASH BORED 25 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %
								Liquid	Plastic	Plasticity Index	
										FREE WATER ENCOUNTERED <u>YES</u> NO	
										AT 24.0 FT. DEPTH.	
										WATER AT 19.7 FT. AFTER 25 minutes	
										DESCRIPTION OF STRATUM	
			3.0							Very stiff dark gray SANDY CLAY (CL) -w/calcareous nodules @ 2'	
			2.5	18			44	14	30		
	5		2.25							-stiff, tan & gray w/ferrous nodules @ 6'	
			2.0	17						-very stiff @ 8'	
	10		3.25	19							
			2.5	28						Very stiff red & gray CLAY (CH) w/calcareous nodules	
	15										
			4.5+	15			38	14	24	Hard tan & gray SANDY CLAY (CL) w/silt pockets & clay layers	
	20									-red & gray @ 23'	
			4.5+	18							
	25										
			2.5	21			34	18	16	Very stiff gray & red SILTY CLAY (CL) w/clay layers & claystones	
	30										
			4.5+	24						Hard gray & red CLAY (CH) w/claystones & slickensides	
	35									-w/calcareous nodules @ 38'	
			4.5+	30							
	40										

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-83

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas
 CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-10
 FILE NO. 87-028
 DATE 2/24/86

Approx. Elev: 102' Page 2 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 25 FEET WASH BORED 25 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO AT FT. DEPTH. WATER AT FT. AFTER
								Liquid	Plastic	Plasticity Index	
DESCRIPTION OF STRATUM											
										Very dense light brown VERY SILTY FINE SAND (SM) -w/clay layers @ 48'	
	-45	N= 50 6"								43	
	-50	N= 50 6"									
	-55	1.5									
	-60	N=18	23				46	18	28	Very stiff red SILTY CLAY (CL) w/clay layers	
	-65	3.5	26				55	22	33	99 Very stiff red CLAY (CH) w/silt & very silty clay layers -hard, gray & red w/slickensides @ 68'	
	-70	4.5	22				50	19	31	-w/calcareous nodules @ 73'	
	-75	4.5	20								
	-80	4.5	21				37	17	20	Hard gray & red SILTY CLAY (CL) w/clay & silt pockets & sandy silt layers	

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

PENETRATION RESISTANCE Bottom @ 80'

III-4B-84

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-10
FILE NO. 87-028
DATE 2/24/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 102'

Page 3 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 25 FEET		WASH BORED 25 TO 100 FEET														
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO															
								Liquid	Plastic	Plasticity Index		AT															
												FT. DEPTH.															
LL	PL	PI	WATER AT		FT. AFTER																						
DESCRIPTION OF STRATUM																											
													Hard gray & red SILTY CLAY (CL)														
	85	2.0											Stiff brown CLAY (CH) w/silt pockets -hard @ 88'														
	90	4.5+											-gray & red @ 93'														
	95	4.5+	24				62	24	38																		
	100	4.5+											Bottom @ 100'														
											<p>Water Level Readings</p> <table border="1"> <thead> <tr> <th>Time (min)</th> <th>Depth (ft)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>24.0</td> </tr> <tr> <td>5</td> <td>22.0</td> </tr> <tr> <td>10</td> <td>21.4</td> </tr> <tr> <td>15</td> <td>20.8</td> </tr> <tr> <td>20</td> <td>20.0</td> </tr> <tr> <td>25</td> <td>19.7</td> </tr> </tbody> </table>			Time (min)	Depth (ft)	0	24.0	5	22.0	10	21.4	15	20.8	20	20.0	25	19.7
Time (min)	Depth (ft)																										
0	24.0																										
5	22.0																										
10	21.4																										
15	20.8																										
20	20.0																										
25	19.7																										

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT III-4B-85

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-11
FILE NO. 87-028
DATE 2/24/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 104'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	
								Liquid	Plastic			Plasticity Index
											FREE WATER ENCOUNTERED <u>YES</u> NO	
											AT 27.0 FT. DEPTH.	
											WATER AT 24.0 FT. AFTER 5 minutes	
											DESCRIPTION OF STRATUM	
			12								Hard dark gray SILTY CLAY "FILL" w/shell	
			3.25								Very stiff tan & dark gray SANDY CLAY (CL)	
	5		3.25	15							w/ferrous & calcareous nodules & sand streaks	
			3.0								-tan & gray @ 4'	
			3.0	14			40	20	20		-w/sand & clay pockets @ 8'	
	10											
			2.5	23							-red & gray w/silty clay layers & slickensides @ 13'	
	15											
			4.5+	14			37	15	22			
	20										-light gray, very sandy w/claystones @ 23'	
			3.25									
	25											
			N=12								Firm red & tan FINE SAND (SP) w/clay pockets & claystones	
	30										-slightly clayey @ 27-30'	
			N= 50/6"									
	35										-very dense w/sandstones @ 33'	
			N= 50/4"									
	40											

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-86

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-11
 FILE NO. 87-028
 DATE 2/24/86

Approx. Elev: 104' Page 2 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 100 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												LL	PL
											WATER AT FT. AFTER		
DESCRIPTION OF STRATUM													
												Very dense red & light gray FINE SAND (SP)	
	45	89/11"										-tan @ 48'	
	50	50/6"								5			
	55	50/6"											
	60	N=30	28				61	24	37			Very stiff red CLAY (CH) w/silt layers & seams	
	65	2.75	24				47	21	26			Very stiff red SILTY CLAY (CL) w/silt pockets & sandy silt layers	
	70	3.75	18				42	15	27	85		-gray & brown w/clay layers @ 68'	
	75	4.5+	17				41	18	23			-hard w/calcareous nodules & clay pockets @ 73'	
	80	2.75	23				31	18	13	99		Dense gray & red CLAYEY SILT (ML) w/clay layers & siltstones	

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

III-4B-87

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-11
FILE NO. 87-028
DATE 2/24/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 104' Page 3 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												FT. DEPTH.	
LL	PL	PI	WATER AT		FT. AFTER								
DESCRIPTION OF STRATUM													
			N=41	21				28	17	11			Dense gray & red CLAYEY SILT (ML) w/clay & silt layers, claystones & siltstones
			4.5+	23				70	23	47			Hard red CLAY (CH) w/silt pockets, claystones & slickensides
			4.5+	20									-gray & brown @ 93'
			4.5+	27									-w/silt seams @ 98'
													Bottom @ 100'

* SLICKENSIDED FAILURE () CONFINING PRESSURE, PSI G.S. GRAIN SIZE
 (N) - STANDARD PENETRATION RESISTANCE (SPT) TSF - POCKET PENETROMETER OR TORVANE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-88

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-12
FILE NO. 87-028
DATE 2/26/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 86'

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 12 FEET		WASH BORED 12 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid	Plastic	Plasticity Index		AT 12.0 FT. DEPTH.	
												LL	PL
DESCRIPTION OF STRATUM													
			2.0										Stiff red & gray SANDY CLAY (CL) -hard, tan & gray w/sand & clay pockets @ 2' -very stiff @ 4'
			4.5	15				40	17	23			
	5		3.5										
			3.75										
	10		3.5	16									Very stiff tan & gray SILTY CLAY (CL) w/calcareous nodules
	15		4.5+	20									Hard gray & red CLAY (CH) w/silt pockets, slickensides & claystones
	20		4.5+	23				55	23	32			
	25		4.5+										
	30										88		Firm brown CLAYEY SILT (ML) w/siltstones
	35	X	N=56										Very dense brown FINE SAND (SP)
	40	X	N=74										

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE
 PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-89

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-12
 FILE NO. 87-028
 DATE 2/26/86

Approx. Elev: 86' Page 2 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 12 FEET WASH BORED 12 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO AT FT. DEPTH. WATER AT FT. AFTER
								Liquid	Plastic	Plasticity Index	
DESCRIPTION OF STRATUM											
											Hard red CLAY (CH) w/silt layers & claystones
	45	4.5+	27								-very stiff @ 48'
	50	2.5	26				60	24	36		-hard, gray & brown w/calcareous nodules @ 53'
	55	4.5	20								
	60	3.5	20				40	18	22		Very stiff light brown SILTY CLAY (CL) w/clay pockets
	65	4.5+	22								Hard gray & red-brown CLAY (CH)
	70	3.5	23				30	20	10		Dense brown CLAYEY SILT (ML)
	75	4.5+	22								Hard red-brown CLAY (CH)
	80	4.5+	26								-red & gray w/silt pockets @ 78'

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

Penetration Resistance
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-90

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-12
FILE NO. 87-028
DATE 2/26/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 86'

Page 3 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 12 FEET		WASH BORED 12 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO		
								Liquid	Plastic	Plasticity Index		AT		
												FT. DEPTH.		
LL	PL	PI	WATER AT		FT. AFTER									
DESCRIPTION OF STRATUM														
													Very stiff gray & red CLAY (CH) w/silt layers	
	85		3.5	32				70	24	46				
			3.75	17									Very stiff tan & gray SILTY CLAY (CL)	
	90													
			3.5	15									Firm light gray FINE SAND (SP) w/clay pockets	
	95													
			N=19	25									Very stiff tan & dark gray SILTY CLAY (CL)	
	100													
													Bottom @ 100'	

Time (min)	Depth (ft)
0	12.0
5	5.2
10	3.9
15	3.6

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE
 PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT III-4B-91

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-13
FILE NO. 87-028
DATE 2/25/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 87'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 15 FEET WASH BORED 15 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %
								Liquid	Plastic	Plasticity Index	
										FREE WATER ENCOUNTERED <u>YES</u> NO	
										AT 14.0 FT. DEPTH.	
										WATER AT 4.3 FT. AFTER 25 minutes	
										DESCRIPTION OF STRATUM	
			2.0							Stiff tan & gray SILTY CLAY (CL) -very silty @ 0-2' -tan & light gray @ 2'	
			2.0	17						-very stiff @ 4'	
	5		2.5							-hard w/clay pockets @ 6'	
			4.5							-w/ferrous nodules & sand pockets @ 8'	
	10		4.5+	14						-stiff, light gray & brown @ 13'	
			1.5	26			42	22	20		
			4.5+	22						Hard gray & red CLAY (CH) w/calcareous nodules & slickensides	
	20		4.5+	20			81	30	51	93	
			4.5+	20						-w/claystones @ 23'	
	25		4.5+	20							
			N=51							Very dense brown SILTY FINE SAND (SM) w/clay pockets	
	30		N=51								
			2.25	25						Stiff red-brown SILTY CLAY (CL) w/clay pockets, claystones & silt pockets	
	35		2.25	25							
			2.5	26			54	22	32	Very stiff red-brown CLAY (CH) w/silt layers	
	40		2.5	26							

* SLICKENSIDED FAILURE
(N) - CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT III-4B-92

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-13

FILE NO. 87-028

CLIENT: West Belt Development, Inc.
Houston, Texas

DATE 2/25/86

Approx. Elev: 87'

Page 2 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 15 FEET		WASH BORED 15 TO 100 FEET	
	DEPTH (feet)	SAMPLFS	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO		
								Liquid	Plastic	Plasticity Index		AT		
												FT. DEPTH.		
LL	PL	PI	WATER AT		FT. AFTER									
DESCRIPTION OF STRATUM														
														Very stiff red-brown CLAY (CH) w/silt pockets
	45		3.75	26										
														-gray & red-brown w/sandy silt layers @ 48'
	50		3.75	29				54	22	32				
														-gray & brown w/sand pockets @ 53'
	55		3.75	23										
														Hard tan & light gray SILTY CLAY (CL) w/calcareous nodules
	60		4.5+	19				43	19	24				
														-very stiff, gray & brown w/siltstones & clay layers @ 63'
	65		3.5	24										
														Dense gray & brown CLAYEY SILT (ML) w/clay pockets
	70		2.25	20				30	20	10				
														Hard dark red CLAY (CH) w/slickensides & silt layers
	75		4.5	25										
	80		4.5+	26										

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

III-4B-93

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-13
FILE NO. 87-029
DATE 2/25/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 87'

Page 3 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 15 FEET		WASH BORED 15 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED	YES	NO
								Liquid	Plastic	Plasticity Index				
AT _____ FT. DEPTH.														
WATER AT _____ FT. AFTER														
DESCRIPTION OF STRATUM														
	85	4.0	31										Very stiff dark red CLAY (CH) w/silt seams & layers	
	90	3.25	17				36	15	21				Very stiff tan & light gray SANDY CLAY (CL) -tan & gray @ 93'	
	95	4.0	16				32	15	17					
														Dense tan & gray SLIGHTLY CLAYEY SAND (SC)
	100	3.0	20											Bottom @ 100'

Time (min)	Depth (ft)
0	14.0
5	9.4
10	6.1
15	5.5
20	4.7
25	4.3

* SLICKSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT)
() CONFINING PRESSURE, PSI TSF - POCKET PENETROMETER OR TORVANE
G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-94

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-14
FILE NO. 87-028
DATE 2/21/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 103'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 25 FEET WASH BORED 25 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %
								Liquid	Plastic	Plasticity Index	
										FREE WATER ENCOUNTERED YES <u>NO</u> AT ** FT. DEPTH. WATER AT _____ FT. AFTER **Caved in @ 23.0'	
										DESCRIPTION OF STRATUM	
			3.5							Very stiff tan & dark gray VERY SANDY CLAY "FILL"	
			2.75	15				29	16	13	Dense dark gray CLAYEY SAND (SC) w/roots -hard @ 4' -tan & light gray w/sand streaks & ferrous nodules @ 6'
			4.5+								
			4.5+								
			4.5+	11							Hard tan & light gray SANDY CLAY (CL)
			15								Dense tan & light gray SILTY FINE SAND (SM)
			N=38								-firm, light gray @ 23'
			N=28							14	-very dense @ 28'
			N=53								
			4.5+	22							Hard gray & red-brown CLAY (CH) w/slickensides & calcareous nodules -light gray & red w/sand pockets @ 38'
			4.5+	22				70	23	47	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-95

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-14

FILE NO. 87-028

CLIENT: West Belt Development, Inc.
Houston, Texas

DATE 2/21/86

Approx. Elev: 103'

Page 2 of 3

FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 25 FEET WASH BORED 25 TO 100 FEET			
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												FT. DEPTH.	
LL	PL	PI	WATER AT		FT. AFTER								
DESCRIPTION OF STRATUM													
													Dense tan & light gray FINE SAND (SP)
	45	X											-light brown @ 48'
	50	X	N=43										
	55	X	N=40										-light gray @ 58'
	60	X	N=41							5			
	65	X	N=50 3"										-very dense w/clay pockets @ 63'
	70		4.5+	23					56	22	34	94	Hard red-brown CLAY (CH) w/calcareous nodules
	75		4.5+	18					45	18	27		Hard gray & red-brown SANDY CLAY (CL) w/calcareous nodules
	80											84	Firm brown CLAYEY SILT (ML) w/sand layers

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-96

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-14
FILE NO. 87-028
DATE 2/21/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 103' Page 3 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 25 FEET		WASH BORED 25 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												FT. DEPTH.	
LL	PL	PI	WATER AT		FT. AFTER								
DESCRIPTION OF STRATUM													
			N=52									Very dense red-brown CLAYEY SILT (ML) w/clay layers, siltstones & claystones	
	85											Hard red-brown SILTY CLAY (CL) w/clay & clayey silt layers	
	90		4.5+	21				35	19	16		Hard gray & red-brown CLAY (CH) w/slickensides, silt streaks & seams & calcareous nodules	
	95		4.5+	26				64	25	39		Very stiff gray & red SANDY CLAY (CL) w/ferrous nodules	
	100		4.0	17				41	15	26		Bottom @ 100'	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-97

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-15
FILE NO. 87-028
DATE 2/27/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 104'

FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 17 FEET		WASH BORED 17 TO 100 FEET		
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES <u>NO</u>	
								Liquid	Plastic	Plasticity Index		AT ** FT. DEPTH.	
												LL	PL
												DESCRIPTION OF STRATUM	
	0-10		18									Stiff dark gray SANDY CLAY (CL) w/roots -very sandy @ 0-2' -tan & light gray w/sand pockets & streaks @ 2' -hard w/ferrous nodules @ 4' -very stiff w/sand seams @ 8'	
	10-15		1.25	17								Firm tan & light gray FINE SAND (SP)	
	15-20		5	4.5+								-tan @ 18'	
	20-25		4.5+									-light gray @ 23'	
	25-30		2.5	17				46	17	29	66	-dense w/clay pockets @ 33'	
	30-35											Stiff gray & red CLAY (CH)	
	35-40											-w/sand pockets & layers @ 38'	

* SLICKSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT)
() CONFINING PRESSURE, PSI TSF - POCKET PENETROMETER OR TORVANE
G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-98

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-15
 FILE NO. 87-028
 DATE 2/27/86

Approx. Elev: 104' Page 2 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 17 FEET		WASH BORED 17 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO	AT FT. DEPTH.	
								Minus No. 200 Sieve - %					WATER AT FT. AFTER
								LL	PL	PI			
DESCRIPTION OF STRATUM													
												Firm red FINE SAND (SP)	
	45	N=23										-very dense w/clay layers @ 48'	
	50	N=50 6"										-dense w/claystones @ 53'	
	55	N=33										-tan w/calcareous nodules & sandy clay layers @ 58'	
	60	N=50 4"										Very stiff brown CLAY (CH) w/silt streaks & slickensides	
	65	3.25	26				58	22	36			-gray & brown w/calcareous nodules @ 68'	
	70	4.0	23										
	75	4.0	17				31	16	15			Very stiff tan & light gray SANDY CLAY (CL) w/sand pockets & streaks	
	80	4.5+	19				42	18	24			Hard tan & gray SILTY CLAY (CL) w/clayey sand layers	

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-99

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-15
FILE NO. 87-028
DATE 2/27/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 104' Page 3 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 17 FEET WASH BORED 17 TO 100 FEET						
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED	YES	NO			
								Liquid	Plastic	Plasticity Index		AT			FT. DEPTH.		
												LL	PL	PI	WATER AT		
DESCRIPTION OF STRATUM																	
															Hard red & light gray SILTY CLAY (CL)		
	85			23				27	19	8					Dense brown CLAYEY SILT (ML) w/clay & silty clay layers, siltstone & claystone nodules		
	90		4.5+	26				71	24	47					Hard red-brown CLAY (CH) w/slickensides -gray & red-brown w/silt pockets @ 93'		
	95		4.5+	25											-w/claystones @ 98'		
	100		4.5+	25											Bottom @ 100'		

• SLICKENSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT)
() CONFINING PRESSURE, PSI TSF - POCKET PENETROMETER OR TORVANE
G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-100

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-16
FILE NO. 87-038
DATE 2/28/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 106'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 21 FEET WASH BORED 21 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %
								Liquid	Plastic	Plasticity Index	
										FREE WATER ENCOUNTERED <u>YES</u> NO	
										AT 21.0 FT. DEPTH.	
										WATER AT ** FT. AFTER 5 minutes **Caved in @ 20.0'	
										DESCRIPTION OF STRATUM	
										Firm dark gray FINE SAND (SP)	
	5		1.5	14				30	14	16	Stiff light gray & tan SANDY CLAY (CL) w/ferrous nodules & sand streaks -hard @ 4' -very stiff w/sand pockets @ 6'
			4.5+								
			4.25								
	10		3.5								
											Firm tan & light gray FINE SAND (SP)
	15		N=19								
											Firm light gray CLAYEY SILT (ML)
	20		N=25							80	
											Firm light gray FINE SAND (SP) -w/sandy clay pockets @ 22'
	25		N=25								
											-light brown w/clay pockets @ 28'
	30		N=16								
											Firm tan CLAYEY SAND (SC) w/clay, sandy clay & sand layers & clay pockets
	35		N=25							65	
											Firm tan & light gray FINE SAND (SP) w/silty sand layers
	40		N=21								

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-101

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-16
 FILE NO. 87-028
 DATE 2/28/86

Approx. Elev: 106' Page 2 of 3

FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 21 FEET		WASH BORED 21 TO 100 FEET				
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	AT FT. DEPTH.	WATER AT FT. AFTER
								Liquid	Plastic	Plasticity Index				
DESCRIPTION OF STRATUM														
	45	N=32									6			Firm tan FINE SAND (SP)
	50	N=50 4"												-very dense, tan & light gray w/ sandstones @ 48'
	55	N=50 4"												-light gray w/clay pockets @ 53'
	60										96			Firm red-brown CLAYEY SILT (ML) w/clay layers & seams & silt pockets
	65	N=50 0"												Very dense red FINE SAND (SP) w/cemented sand layers
	70	N=32	24											Dense light brown SILTY FINE SAND (SM)
	75	4.5+	17					42	16	26	86			Hard light gray & tan SILTY CLAY (CL) w/calcareous & ferrous nodules
	80	4.5+	20					36	19	17	89			-gray & brown w/silty sand layers @ 78'

* SLICKSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-102

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-16
FILE NO. 87-028
DATE 2/28/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 106' Page 3 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 21 FEET		WASH BORED 21 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO	AT FT. DEPTH.
								Liquid	Plastic	Plasticity Index		
Minus No. 200 Sieve - %												
DESCRIPTION OF STRATUM												
												Hard red-brown SILTY CLAY (CL) w/silt layers & calcareous nodules
	85	X	N=56	21				41	20	21		
	90	■	4.5+	22								Hard gray & red-brown CLAY (CH) w/slickensides -w/silt pockets @ 93'
	95	■	4.5+	24				59	23	36		
	100	■	4.5+	28								
												Bottom @ 100'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

PENETRATION RESISTANCE III-4B-103

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-17
FILE NO. 87-028
DATE 2/24/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 106'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 25 FEET		WASH BORED 25 TO 100 FEET	
	DEPTH (feet)	SAMPLFS	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED <u>YES</u> NO
								Liquid	Plastic	Plasticity Index		
											AT ** FT. DEPTH.	
											WATER AT **Caved in @ 25.0' FT. AFTER	
											DESCRIPTION OF STRATUM	
	4.5+										Hard gray SANDY CLAY (CL)	
	4.5+										-tan & gray w/ferrous nodules @ 4'	
	5										-tan & light gray w/sand streaks @ 6'	
	4.5+		10									
	4.5+										-very stiff, tan & gray @ 13'	
	10											
	3.25	16					34	19	15			
	15										Firm tan & gray CLAYEY SAND (SC)	
											Stiff tan & gray SILTY CLAY (CL)	
	20	N=20	14									
											Very stiff tan & gray CLAY (CH) w/ferrous & calcareous nodules & slickensides	
	25	3.25	21								-hard, gray & red w/claystones @ 28'	
	30	4.5+	20				54	21	33			
											-w/silt layers @ 38'	
	35	4.5+	22									
	40	4.5	20									

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT III-4B-104

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-17
 FILE NO. 87-028
 DATE 2/24/86

Approx. Elev: 106'

Page 2 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 25 FEET		WASH BORED 25 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO
								Liquid	Plastic	Plasticity Index		
DESCRIPTION OF STRATUM												
	45		3.75	30				81	28	53		Hard red CLAY (CH) -very stiff @ 43'
	50	N=68										Very dense tan FINE SAND (SP)
	55	N=52										
	60	N=50 6"										
	65		4.5	30				65	26	39		Hard red CLAY (CH) w/silt layers -very stiff, gray & red @ 68'
	70		3.5	26				56	24	32		
	75		4.0	17				35	17	18		Very stiff gray & brown SILTY CLAY (CL) w/siltstones, clay pockets & ferrous nodules -w/sandy silt layers @ 78'
	80		2.5	21				34	18	16		

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-105

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-17
FILE NO. 87-028
DATE 2/24/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 106'

Page 3 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 25 FEET		WASH BORED 25 TO 100 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO		
								Liquid	Plastic	Plasticity Index		AT FT. DEPTH.		
												LL	PL	PI
DESCRIPTION OF STRATUM														
			4.5+	21				45	20	25			Hard gray & red SILTY CLAY (CL) w/silt layers	
			4.5+	27									Hard gray & red CLAY (CH)	
			4.5+	26									-red @ 93'	
			4.0	32									-very stiff, gray & red w/silt layers @ 98'	
													Bottom @ 100'	

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-106

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-18
 FILE NO. 87-028
 DATE 2/26/86

Approx. Elev: 103'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						Minus No. 200 Sieve - %	DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid		Plastic		Plasticity Index
			LL	PL	PI	WATER AT 16.8 FT. AFTER 15 minutes		DESCRIPTION OF STRATUM				
[Diagonal Hatching]	1.5										Stiff dark gray SANDY CLAY (CL) -gray w/calcareous & ferrous nodules @ 2' -very stiff, tan & light gray @ 4'	
	1.75											
[Diagonal Hatching]	5		2.5	17				39	18	21		
[Diagonal Hatching]			2.5									
[Diagonal Hatching]	10		2.25	19				53	18	35	Stiff tan & dark gray CLAY (CH) w/many ferrous & calcareous nodules	
[Diagonal Hatching]	15		3.5	16							Very stiff tan & light gray SANDY CLAY (CL) -w/calcareous nodules @ 18'	
[Diagonal Hatching]	20		4.5+	17				47	17	30		
[Diagonal Hatching]	25		4.5+	25							Hard gray & tan CLAY (CH) w/calcareous nodules, slickensides & claystones	
[Diagonal Hatching]	30	X	N=52								Very dense red & light gray SILTY FINE SAND (SM) w/siltstones -light gray w/sandy clay & clayey sand layers @ 33'	
[Diagonal Hatching]	35	X	N=50 6"								-tan @ 38'	
[Diagonal Hatching]	40	X	N=83									

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-107

LOG OF BORING

PROJECT: West Belt Landfill
 Harris County, Texas

CLIENT: West Belt Development, Inc.
 Houston, Texas

BORING NO. CB-18
 FILE NO. 87-028
 DATE 2/26/86

Approx. Elev: 103' Page 2 of 3

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 100 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	
								Liquid	Plastic	Plasticity Index		FREE WATER ENCOUNTERED YES NO
LL	PL	PI	DESCRIPTION OF STRATUM									
[Symbol: Dotted pattern]	45	N=50 4"								Very dense tan & brown SILTY FINE SAND (SM) -w/clay seams @ 53'		
	50	N=67										
	55	N=69										
	60	N=50 6"							16			
[Symbol: Diagonal lines]	65	N=34	24				55	24	31	Very stiff gray & red-brown CLAY (CH) w/silt layers & sandy silt seams & pockets		
[Symbol: Horizontal lines]	70	4.25	18				41	17	24	Very stiff tan & gray SILTY CLAY (CL)		
[Symbol: Diagonal lines]	75		17				29	18	11	Firm gray & brown CLAYEY SAND (SC) w/clay layers w/many calcareous nodules & claystones @ 78'		
[Symbol: Dotted pattern]	80	N=25	23				24	19	5			

* SLICKENSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT)
 () CONFINING PRESSURE, PSI TSF - POCKET PENETROMETER OR TORVANE
 G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-108

LOG OF BORING

PROJECT: West Belt Landfill
Harris County, Texas

BORING NO. CB-18
FILE NO. 87-028
DATE 2/26/86

CLIENT: West Belt Development, Inc.
Houston, Texas

Approx. Elev: 103'

Page 3 of 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 30 FEET		WASH BORED 30 TO 100 FEET		
	DEPTH (feet)	SAMPLFS	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO			
								Liquid	Plastic	Plasticity Index		AT		FT. DEPTH.	
												LL	PL	PI	WATER AT
DESCRIPTION OF STRATUM															
			3.75	23									Very stiff gray & red-brown CLAY (CH) w/many calcareous nodules, slickensides claystones & silt pockets & layers		
													Firm red & light gray SANDY SILT (ML)		
		X	N=29	22				50	20	30			Very stiff gray & red-brown CLAY (CH) w/silt & silty clay layers & slickensides -hard @ 93'		
			4.5+	27									-w/silt streaks & seams @ 98'		
			4.5+	30				70	26	44			Bottom @ 100'		

Time (min)	Depth (ft)
0	27.0
5	23.5
10	17.1
15	16.8
20	16.2

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-109

WESTERN CONTRACTORS SERVICES
1983 - 1984

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-1
FILE NO. 83-180
DATE 9/6/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 10 FEET		WASH BORED 10 TO 90 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												LL	PL
DESCRIPTION OF STRATUM													
5			4.5+									Stiff dark brown SANDY CLAY (CL) "FILL" w/building debris	
4.5+			4.5+ 10				43	15	28			Firm dark gray FINE SAND (SP) "FILL"	
4.5+			4.5+									Hard light gray & tan SANDY CLAY (CL) -tan & gray w/ferrous nodules @ 6' -w/clay pockets & sand streaks @ 8'	
10													
15			4.5+									Dense light gray & tan CLAYEY SAND (SC)	
20	X		N=44									Dense light gray & tan FINE SAND (SP)	
25													
30	X		N=27									-firm @ 28'	
35												-w/clay layers @ 34'-35'	
40	X		N=21									-light gray @ 38'	

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-110
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH TONS PER SQ FOOT

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-1
FILE NO. 83-180
DATE 9/6/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Page 2

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED	TO	FEET					
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET					
								Liquid	Plastic	Plasticity Index	Minus No. 200 Sieve - %			FREE WATER ENCOUNTERED			YES	NO
														LL	PL	PI	AT	FT. DEPTH,
DESCRIPTION OF STRATUM																		
45												Firm light gray FINE SAND (SP)						
50		N=78										Stiff red & light gray CLAY (CH) w/calcareous nodules Very dense light gray FINE SAND (SP)						
55												-clay layers @ 57'						
60		N=85 10.5"																
65																		
70			3.0	28			56	22	34			Very stiff red & gray CLAY (CH)						
75												Hard tan & gray SANDY CLAY (CL) w/sand layers & pockets						
80			4.5+	17			30	15	15									

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

Penetration Resistance
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-111
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

CLIENT: Western Contractors Services, Inc.
Houston, Texas

BORING NO. CB-1
FILE NO. 83-180
DATE 9/6/83

Page 3

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED		TO		FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	WASH BORED		TO		FEET	
								LL	PL	PI		FREE WATER ENCOUNTERED		YES		NO	
												AT		FT. DEPTH.			
												WATER AT		FT. AFTER			
DESCRIPTION OF STRATUM																	
																	Hard tan & gray SANDY CLAY (CL) w/sand layers & pockets
	85																Hard red SILTY CLAY (CL) w/clay & sand pockets
	90	4.5+	23				36	20	16								
																	Bottom @ 90'

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-112
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH TONS PER SQ FOOT

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-2
FILE NO. 83-180
DATE 8/31/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						Minus No. 200 Sieve - %	DRY AUGERED 0 TO 40 FEET WASH BORED 40 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS				
								LL			PL	PI
										FREE WATER ENCOUNTERED <u>YES</u> NO		
										AT 37.0 FT. DEPTH.		
										WATER AT 38.1 FT. AFTER 15 minutes		
										DESCRIPTION OF STRATUM		
	4.5+									Stiff brown & gray SANDY CLAY (CL) w/shell, asphalt, gravel & "FILL" crushed limestone -hard, gray, w/sand layers @ 2'		
	4.5+									Hard tan & light gray SANDY CLAY (CL) w/clay pockets -w/sand pockets @ 6'		
	4.5+											
	4.5+	11					38	15	23			
		N=17								Firm light gray FINE SAND (SP) w/very slightly clayey sand layers		
		N=30								Hard tan & light gray SANDY CLAY (CL)		
	4.5+									Hard tan & light gray CLAY (CH) w/many calcareous nodules & sand pockets		
	4.5+	11					31	15	16	Hard light gray SANDY CLAY (CL) w/many calcareous nodules		
	4.5+									Hard red & light gray CLAY (CH)		
		N=84								Very dense tan & light gray FINE SAND (SP)		

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE

III-4B-113

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-2
FILE NO. 83-180
DATE 8/31/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Page 2

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED	TO	FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET	
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED		YES	NO
											LL	PL	PI	AT
DESCRIPTION OF STRATUM														
												Very dense tan & light gray FINE SAND (SP)		
	45											-tan @ 48'		
	50	N=50 5"												
	55													
	60		4.5+	27				50	21	29		Hard red CLAY (CH)		
	65													
	70		4.0											
	75													
	80		2.5	24				31	20	11		Very stiff light gray & red VERY SILTY CLAY (CL) -w/clay & sandy silt layers		

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-114
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-2
FILE NO. 83-180
DATE 8/31/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED	TO	FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	WASH BORED	TO	FEET	
								Liquid	Plastic	Plasticity Index		FREE WATER ENCOUNTERED	YES	NO	
	AT	FT. DEPTH.								WATER AT	FT. AFTER				
	DESCRIPTION OF STRATUM														
															Very stiff red & light gray VERY SILTY CLAY (CL) w/clay & sandy silt layers
	85														Hard red CLAY (CH)
			1.0	24					22	12	10				Firm red SANDY SILT (ML) w/clay pockets
	90		4.5+												Hard red VERY SILTY CLAY (CL)
	95														Hard light gray & red CLAY (CH) w/silt seams
	100		4.5+	29											Bottom @ 100'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-3
FILE NO. 83-180
DATE 8/31/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 10 FEET WASH BORED 10 TO 100 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												FT. DEPTH.	
LL	PL	PI	WATER AT		FT. AFTER								
DESCRIPTION OF STRATUM													
			4.5+									Hard gray & brown SANDY CLAY (CL) "FILL" w/asphalt & shell	
			4.5+	14				31	15	16		Hard tan & light gray SANDY CLAY (CL) w/sand pockets	
	5		4.25										
			4.5+									-very stiff @ 8'	
	10		2.5										
												Firm light gray FINE SAND (SP)	
	15		N=17										
												Hard tan & light gray SILTY CLAY (CL) w/sand pockets	
	20		4.0	14				33	15	18			
			4.5+									Hard light gray & tan SLIGHTLY SANDY CLAY (CL) -w/sand pockets	
	25												
			4.5+									Hard light gray & tan SANDY CLAY (CL) w/calcareous nodules	
	30												
			4.5+										
	35											Firm light gray FINE SAND (SP)	
	40												

• SLICKENSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT) (1) CONFINING PRESSURE, PSI TSF - POCKET PENETROMETER OR TORVANE (M-4B-116) G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-3
FILE NO. 83-180
DATE 8/31/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

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SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED	TO	FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET	
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED		YES	NO
											LL	PL	PI	AT
DESCRIPTION OF STRATUM														
													Firm light gray FINE SAND (SP)	
													-dense @ 43'	
			N=33											
	45	X												
	50													
	55	X	N=28										-firm @ 53'	
	60												Hard red CLAY (CH) w/silt layers	
	65		4.5+											
	70													
	75		4.5+	22				33	20	13			Hard red VERY SILTY CLAY (CL) w/clay pockets	
	80												Dense red FINE SAND (SP) w/calcareous nodules & silty sand layers	

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-117
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH TONS PER SQ. FOOT

PENETRATION RESISTANCE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
 Harris County, Texas

CLIENT: Western Contractors Services, Inc.
 Houston, Texas

BORING NO. CB-3
 FILE NO. 83-180
 DATE 9/2/83

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED	TO	FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET	
								LL	PL	PI	FREE WATER ENCOUNTERED		YES	NO
											AT	FT. DEPTH.	WATER AT	FT. AFTER
	85	1.5	21				25	18	7				Firm light gray & red CLAYEY SAND (SC)	
	90												Hard red CLAY (CH) -tan & light gray @ 90'	
	95	4.5+	17				45	20	25				Hard tan & gray SILTY CLAY (CL) -tan & light gray w/silt & sand pockets @ 98'	
	100	4.5+	17				44	21	23				Bottom @ 100'	

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE

11-4B-118

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-4
FILE NO. 83-180
DATE 9/6/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 89'

FIELD DATA			LABORATORY DATA						DRY AUGERED TO FEET		WASH BORED TO FEET		
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												FT. DEPTH.	
WATER AT		FT. AFTER											
DESCRIPTION OF STRATUM													
Very stiff SLIGHTLY SANDY CLAY (CL)													
Firm lighth gray FINE SAND (SP)													
-very dense @ 28'													
-dense, light gray & red w/sandstones & clay layers @ 38'													

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-119
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-4
FILE NO. 83-180
DATE 9/6/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Page 2

SOIL SYMBOL	DEPTH (feet)	SAMPLES	FIELD DATA		LABORATORY DATA							DRY AUGERED WASH BORED	TO	FEET FEET												
			Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No 200 Sieve - %				FREE WATER ENCOUNTERED	YES	NO									
								Liquid	Plastic	Plasticity Index																
								LL	PL									PI								
DESCRIPTION OF STRATUM																										
	45																									Dense light gray & red SILTY FINE SAND (SM) w/clay layers
			4.0	23						47	23	24														Hard red & light gray SILTY CLAY (CL)
	50																									
	55																									
	60		3.0	23						48	21	27														-very stiff, tan & red w/clay pockets, silt stones & sand pockets & layers @ 58'
	65		4.5+ 3.0	25						47	20	27														-gray & red w/clayey sand layers @ 63'
																										Bottom @ 65'

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE M-4B-120
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-5
FILE NO. 83-180
DATE 11/21/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							Minus No. 200 Sieve - %	DRY AUGERED 0 TO 32 FEET		WASH BORED 32 TO 80 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS				FREE WATER ENCOUNTERED YES NO		AT FT. DEPTH.	
								Liquid	Plastic	Plasticity Index		WATER AT FT. AFTER		Piezometer P-5 installed in borehole	
												LL	PL	PI	DESCRIPTION OF STRATUM
			1.25												Stiff dark brown SANDY CLAY (CL)
			1.25	18	108			43	17	26					Stiff tan & light gray SILTY CLAY (CL)
	5		2.75												Very stiff tan & light gray SANDY CLAY (CL)
			2.75												w/clayey sand seams & caliche
			2.25												-tan, brown & light gray, slightly sandy w/ferrous nodules @ 8'
	10														-stiff, tan & light gray @ 13'
			2.0	19	109			36	17	19					-hard @ 18'
	15														
			4.5+												
	20														
			N=50 5"								51				Very dense tan & light gray VERY CLAYEY SAND (SC)
	25														w/calcareous nodules & caliche
			N=50 3"												Very dense tan & light gray FINE SAND (SP)
	30														w/caliche
															-w/cemented sand layers @ 28'
			N=50 3"												-light red w/calcareous nodules @ 33'
	35														
			N=64												-red & light brown w/slightly clayey sand pockets @ 38'
	40														

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE

11-4B-121

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
 Harris County, Texas

CLIENT: Western Contractors Services, Inc.
 Houston, Texas

BORING NO. CB-5
 FILE NO. 83-180
 DATE 11/21/83

Page 2

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED WASH BORED	TO TO	FEET FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS					
								Liquid				Plastic	Plasticity Index
										FREE WATER ENCOUNTERED YES NO			
										AT FT. DEPTH.			
										WATER AT FT. AFTER			
										DESCRIPTION OF STRATUM			
										Dense light gray SILTY FINE SAND (SM)			
	45	X	N=67							17			
	50	X	N=50 2"							Very dense red & tan FINE SAND (SP) w/sandstones -tan @ 51'			
	55	X	N=68										
	60	X	N=84							-tan & brown w/claystones @ 63'			
	65	X	N=85 9"										
	70		2.75	21	109		42	18	24	Very stiff red-brown & light gray SANDY CLAY (CL) w/sand pockets & calcareous nodules -tan & red @ 73'			
	75		4.0										
	80									Dense red-brown & tan SLIGHTLY CLAYEY SAND (SC)			

* SLICKSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - PENETRATION RESISTANCE Bottom @ 80'
 TSF - STANDARD PENETROMETER OR TORVANE III-4B-122
 ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-6
FILE NO. 83-180
DATE 11/21/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 15 FEET		WASH BORED 15 TO 80 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												LL	PL
WATER AT _____ FT. AFTER											Piezometer P-6 installed in borehole		
DESCRIPTION OF STRATUM													
[Diagonal Hatching]	2.75											Very stiff brown SANDY CLAY (CL) -dark brown @ 2'	
	2.75											-hard, tan & light gray w/ferrous & calcareous nodules @ 4'	
	5											-stiff, light gray & red-brown, slightly sandy @ 8'	
	4.25											-very stiff light gray & brown w/caliche @ 13'	
	4.0		15	120								-tan & brown w/clayey sand seams @ 18'	
	10		2.5										
	15		3.25										
	20		3.5										
	25												Dense light gray & brown SLIGHTLY CLAYEY SAND (SC) w/clayey sand layer @ 23'-24'
	30	X	N=31										Dense light gray & brown FINE SAND (SP) -light gray @ 33'
35	X	N=43									9	-w/cemented sand layer @ 36'-37.5'	
40	X	N=50 6"II										-very dense, tan & brown w/calcareous nodules @ 38'	

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-123
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
 Harris County, Texas

CLIENT: Western Contractors Services, Inc.
 Houston, Texas

BORING NO. CB-6
 FILE NO. 83-180
 DATE 11/21/83

Page 2

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED	TO	FEET				
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	WASH BORED	TO	FEET			
								Liquid	Plastic	Plasticity Index		FREE WATER ENCOUNTERED	YES	NO			
												AT	FT. DEPTH.				
								WATER AT	FT. AFTER								
DESCRIPTION OF STRATUM																	
45	N=63																Dense tan & brown FINE SAND (SP) w/calcareous nodules
50	N=52																-red-brown w/clay layers & claystones @ 48'
55	N=92																-very dense, tan, fine-medium @ 53'
60	N=59																-dense, tan & red-brown w/clayey sand layers @ 58'
65	N=31	25					45	20	25								Hard red-brown SANDY CLAY (CL) w/sand pockets & layers
70	4.25																-tan & light gray @ 68'
75	3.0	20	106				37	18	19								-very stiff, red-brown & light gray w/clay pockets @ 73'
80																	Dense red SILTY FINE SAND (SM) w/sandy silt layers

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 TSF - STANDARD PENETRATION RESISTANCE
 PENETRATION RESISTANCE Bottom @ 80'
 STANDARD PENETRATION RESISTANCE @ 75-124'
 POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-7
FILE NO. 83-180
DATE 1/3/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 10 FEET		WASH BORED 10 TO 100 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												FT. DEPTH.	
LL	PL	PI	WATER AT										
											Piezometer P-7 installed in borehole		
											DESCRIPTION OF STRATUM		
[Diagonal Hatching]	1.0											Medium brown SLIGHTLY SANDY CLAY (CL) w/ferrous nodules	
	1.0												
[Diagonal Hatching]	5		1.75	24	102			56	19	37		Stiff tan & gray CLAY (CH) w/ferrous & calcareous nodules	
	4.0											Very stiff tan & brown SLIGHTLY SANDY CLAY (CL) w/ferrous & calcareous nodules	
[Diagonal Hatching]	10		4.5+									-light gray & red-brown @ 8'	
	15		4.5+	14	120			31	15	16		Hard tan & light gray SANDY CLAY (CL) w/ferrous nodules	
[Diagonal Hatching]	20		4.5+									-slightly sandy @ 18'	
	25		3.75									Very stiff light gray SILTY CLAY (CL) w/calcareous nodules	
[Diagonal Hatching]	30		2.25									-light gray & red-brown @ 28'	
	35		N=58									Dense tan FINE SAND (SP)	
[Dotted Pattern]	40		N=50 2"									-very dense, tan & red-brown w/silty clay layers @ 38'	

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
III-4B-125 ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-7
FILE NO. 83-180
DATE 1/3/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						Minus No. 200 Sieve - %	DRY AUGERED	TO	FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET		
								LL		PL	PI	FREE WATER ENCOUNTERED		YES	NO
												AT	FT. DEPTH.	WATER AT	FT. AFTER
DESCRIPTION OF STRATUM															
												Very dense red-brown FINE SAND (SP)			
	45	N=50 6"										-light gray fine-medium @ 48'			
	50	N=65										6			
	55	N=40	21				29	15	14			Hard red & light gray VERY SANDY CLAY (CL) w/calcareous nodules & clayey sand layers -red-brown @ 58'			
	60											Very stiff red-brown CLAY (CH)			
	65	3.5	29	96			59	26	33			-red-brown & tan @ 68'			
	70	3.5													
	75	3.25										Very stiff red-brown SILTY CLAY (CL) w/clayey sand layers			
	80	4.5+										-hard, red-brown & light gray w/calcareous nodules @ 78'			

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE

4B-126

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-7
FILE NO. 83-180
DATE 1/3/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

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SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED WASH BORED	TO TO	FEET FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS						Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED AT	YES NO
								Liquid	Plastic	Plasticity Index	FT. DEPTH.	FT. AFTER				
	LL	PL	PI	DESCRIPTION OF STRATUM												
	85	3.25	24	103			34	17	17							Very stiff red-brown SILTY CLAY (CL) w/silt pockets & clayey silt layers
																-hard @ 88'
	90	4.5+														-red-brown & light gray w/silt seams & layers @ 93'
	95	4.5+														
	100	4.5+														Bottom @ 100'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-127
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-8
FILE NO. 83-180
DATE 11/21/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 15 FEET WASH BORED 15 TO 75 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												LL	PL
WATER AT FT. AFTER											Piezometer P-8 installed in borehole		
DESCRIPTION OF STRATUM													
	1.5											Stiff dark brown SANDY CLAY (CL)	
	2.25											-very stiff, light gray w/clayey sand seams & ferrous & calcareous nodules @ 2'	
	5	1.5										-stiff @ 4'	
		2.25	17	114			42	15	27				-very stiff, tan & light gray @ 6'
		2.5											-tan & brown @ 8'
	10	2.5											-red, light gray & tan w/sand seams, caliche & crayfish holes @ 13'
	15	2.5											-hard, tan & light gray @ 18'
	20	4.5+	15	119			40	15	25				
	25	N=50 3"											
	30	4.5+	21	107			43	20	23				Hard light gray & brown SILTY CLAY (CL) w/silt pockets & calcareous nodules
35	4.5+											-red & tan @ 33'	
40												Dense red-brown FINE SAND (SP)	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-128
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-8
FILE NO. 83-180
DATE 11/21/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED WASH BORED	TO TO	FEET FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS					Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO
								LL	PL	PI	AT FT. DEPTH.	WATER AT FT. AFTER		
DESCRIPTION OF STRATUM														
												Very dense light red-brown MEDIUM SAND (SP)		
	45	N=50 3"										-light gray slightly silty w/claystones @ 48'		
	50	N=50 5"										-red-brown w/silt seams @ 53'		
	55	N=50 4"												
	60	N=29										Hard red-brown CLAY (CH) w/silty clay layers & sandstones		
	65	4.5+	23	102				49	23	26		Hard red-brown SILTY CLAY (CL) w/silt layers		
	70	4.5+										-brown & gray w/calcareous nodules @ 68'		
	75	4.5+	23	103				45	21	24		-light gray & red-brown w/clayey sand seams @ 73'		
												Bottom @ 75'		

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE

4B-129

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-9
FILE NO. 83-180
DATE 1/24/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105.5'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED 0 TO 15 FEET		WASH BORED 15 TO 78 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		AT	
												LL	PL
WATER AT _____ FT. AFTER Piezometer P-A installed in borehole													
DESCRIPTION OF STRATUM													
			1.0									Medium dark brown CLAY (CH) "FILL" w/shell & sand layers	
			1.5									Stiff brown SANDY CLAY (CL) w/sand seams & ferrous nodules	
	5		1.25									-tan & brown @ 4'	
			2.25	13	123			27	15	12		-tan & light gray w/sand pockets @ 6'	
			2.75										
	10												
												Dense tan & light gray FINE SAND (SP) w/claystones	
	15		N=37									-w/clay layers @ 16'-17'	
												Very stiff light gray & tan CLAY (CH) w/organic matter & slickensides	
	20		N=25									-tan & light gray w/ferrous nodules @ 23'	
			3.75	20	109			54	19	35		-stiff, light gray & tan w/slickensides @ 28'	
	25												
			1.5									-w/slightly clayey silt layer @ 32'-34'	
	30											-hard w/silty clay layers & silt seams @ 33'	
	35		N=43									Dense light gray & tan FINE SAND (SP) -w/clay layer @ 37'-38.5'	
	40												

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-130
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-9
FILE NO. 83-180
DATE 1/24/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED	TO	FEET				
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET		
								Liquid	Plastic	Plasticity Index	Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED		YES	NO
												LL	PL	PI	AT
DESCRIPTION OF STRATUM															
											Dense light gray & tan FINE SAND (SP) w/clay layers & calcareous nodules				
	45	X	N=85							12	Very dense light brown SILTY FINE SAND (SM)				
	50	X	N=50 4"								Very dense brown FINE SAND (SP) w/claystones -tan @ 53'				
	55	X	N=83												
	60	X	N=50 5"												
	65	■	4.5+								Hard tan & red-brown SILTY CLAY (CL) w/clay & clayey silt pockets -very stiff, red-brown w/silt layers @ 68'				
	70	■	2.75	22	107			48	19	29					
	75	■	4.25 4.25								-hard, brown & gray @ 75'				
	80										Bottom @ 78'				

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

• PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT) B-131
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
 Harris County, Texas

CLIENT: Western Contractors Services, Inc.
 Houston, Texas

BORING NO. CB-10
 FILE NO. 83-180
 DATE 1/26/84

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						Minus No. 200 Sieve - %	DRY AUGERED 0 TO 10 FEET WASH BORED 10 TO 70 FEET	FREE WATER ENCOUNTERED YES NO AT FT. DEPTH. WATER AT FT. AFTER	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS					
								LL	PL				PI
											DESCRIPTION OF STRATUM		
											Stiff brown SILTY CLAY (CL) "FILL" w/organic matter		
											Firm dark brown SLIGHTLY SILTY FINE SAND (SM)		
	5		2.0	17	113			34	14	20	Stiff tan & gray SANDY CLAY (CL) w/sand pockets & seams & ferrous nodules -very stiff @ 6' -stiff @ 8'		
			3.25										
	10		2.0								-w/sand layers @ 12'		
	15		N=19								Firm light gray FINE-MEDIUM SAND (SP)		
											Very stiff light gray & brown CLAY (CH)		
	20		3.5										
	25		3.5	23	104			52	20	32	-tan & light gray w/ferrous nodules, caliche & slickensides		
	30		4.5+								Hard light gray & red-brown SLIGHTLY SILTY CLAY (CL) w/calcareous nodules, slickensides & organic matter		
	35		4.5+								Hard light gray & red-brown SANDY CLAY (CL) w/many calcareous nodules		
	40		N=51								Dense brown FINE SAND (SP) w/calcareous nodules & sandy clay layers		

* SLICKENSIDED FAILURE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-10
FILE NO. 83-180
DATE 1/26/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Page 2

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED	TO	FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED	YES	NO
Minus No. 200 Sieve - %											WATER AT	FT. AFTER	
DESCRIPTION OF STRATUM													
												Very dense brown FINE SAND (SP)	
	45	N=50 5"										-firm, brown & light gray w/silty sand layers @ 48'	
	50	N=27										-dense @ 53'	
	55	N=40										-slightly clayey silt layer @ 57'-58'	
	60	4.5+										Hard red-brown CLAY (CH) w/slickensides & calcareous nodules -slightly silty @ 58'-60'	
	65	3.75	25	101			67	26	41			-very stiff, red-brown @ 63'	
	70	4.0										-brown w/silty clay seams & slickensides @ 68'	
												Bottom @ 70'	

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G S GRAIN SIZE
 PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE

4B-133

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
 Harris County, Texas

CLIENT: Western Contractors Services, Inc.
 Houston, Texas

BORING NO. CB-11
 FILE NO. 83-180
 DATE 1/26/84

Approx. Elev. 105.5'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 10 FEET		WASH BORED 10 TO 75 FEET				
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %				
								Liquid	Plastic	Plasticity Index	LL	PL	PI	FREE WATER ENCOUNTERED	
														AT	NO
DESCRIPTION OF STRATUM															
1.5											Stiff dark brown SLIGHTLY SILTY CLAY (CL) w/calcareous nodules				
5											Firm brown SLIGHTLY CLAYEY SAND (SC)				
1.5											Stiff tan & brown SANDY CLAY (CL) w/sand seams & pockets & ferrous nodules				
4.0		13	119				31	15	16		-very stiff, tan & light gray, very sandy @ 6'				
10		2.5									-sandy w/clay streaks @ 8'				
15											Firm light gray & tan SLIGHTLY CLAYEY SAND (SC) w/sandy clay & sand layers				
20		2.75									Very stiff red & light gray CLAY (CH) w/slickensides, clayey sand pockets, sand seams & ferrous nodules				
25		4.0	21	105			54	20	34		-tan & light gray w/clay seams & pockets @ 23'				
30		3.5									Very stiff red-brown & light gray SLIGHTLY SILTY CLAY (CL) w/clayey silt pockets & ferrous & calcareous nodules				
35		2.5	16	117			34	17	17		-light gray & red, very silty w/silty sand layers @ 33'				
40		N=50 3"									Very dense light gray & red FINE SAND (SP)				

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-11
FILE NO. 83-180
DATE 1/26/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

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SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED	TO	FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET	
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED		YES	NO
											LL	PL	PI	AT
DESCRIPTION OF STRATUM														
												Very dense tan FINE SAND (SP)		
	45	N=83									12	Very dense light gray SILTY FINE SAND (SM)		
	50	N=50 4"										Very dense tan FINE-MEDIUM SAND (SP) clay streaks & claystones -cemented sand layer @ 51'-53' -dense, brown @ 53'		
	55	N=30												
	60	2.5										Very stiff red-brown CLAY (CH) w/silt layers & seams, siltstones & silty clay layers -red w/slickensides @ 63'		
	65	3.75	25	101				67	27	40		-brown w/calcareous nodules w/clayey silt seams @ 68'		
	70	4.35										-slightly silty w/slickensides @ 73'		
	75	4.5+										Bottom @ 75'		

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-135
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-12
FILE NO. 83-180
DATE 9/28/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 90 FEET				
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid	Plastic	Plasticity Index		AT 27.5 FT. DEPTH.	
												LL	PL
DESCRIPTION OF STRATUM													
													Dense gray SILTY FINE SAND (SM) "FILL" w/clay pockets
	5												Firm gray SANDY SILT (ML) -w/clay layers @ 4'
	10	N=21 4.5											Hard tan & gray SANDY CLAY (CL) w/sand seams & streaks -slightly sandy @ 6'-8'
	15	N=11											Firm light gray SLIGHTLY CLAYEY SAND (SC)
	20	2.75											Very stiff red & gray CLAY (CH) w/slickensides
	25	4.5+ 17					46	16	30				-hard, tan & gray, slightly sandy w/sand pockets @ 23'
	30	N=19											Firm tan & light gray SLIGHTLY CLAYEY SAND (SC)
	35	N=29											
	40	50 5"											-very dense @ 38'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (ASTM D-1586)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-12
FILE NO. 83-180
DATE 9/28/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED	TO	FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET		
								LL	PL	PI	Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED		YES	NO
												AT	FT. DEPTH.	WATER AT	FT. AFTER
DESCRIPTION OF STRATUM															
[Dotted pattern]	45	50 4"											Very dense FINE SAND (SP) w/sandstones		
	50	84 9"													
	55	50 5.5"													
[Diagonal hatching]	60	N=20											Very stiff red SILTY CLAY (CL) w/clayey silt layers		
	65	4.5+	28				64	29	35				Hard red CLAY (CH) -very stiff w/shells @ 68'		
	70	3.5													
	75	3.75	19				35	19	16				Very stiff gray & brown SILTY CLAY (CL) w/clay pockets		
	80	4.25											Very stiff light gray & red CLAY (CH) slightly silty		

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-12
FILE NO. 83-180
DATE 9/28/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

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SOIL SYMBOL	FIELD DATA		LABORATORY DATA						Minus No. 200 Sieve - %	DRY AUGERED TO FEET		WASH BORED TO FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO		AT FT. DEPTH.		
								LL		PL	PI	WATER AT FT. AFTER			
												DESCRIPTION OF STRATUM			
	85	4.5+											Hard light gray & red CLAY (CH) slightly silty -w/slickensides & sand streaks @ 83'		
	90	4.5+											-w/sand layers @ 88'		
													Bottom @ 90'		

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-13
FILE NO. 83-180
DATE 10/2/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 30 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED 30 TO 90 FEET
								Liquid	Plastic	Plasticity Index	Free Water Encountered YES NO
LL	PL	PI	DESCRIPTION OF STRATUM								
[Diagonal Hatching]	5	4.5+								Hard dark gray VERY SANDY CLAY (CL) -gray @ 2' -tan & gray @ 4' -w/organic matter @ 6' -w/sand streaks & pockets @ 8'	
		4.5+	9				28	16	12		
	10	4.5									
[Dotted]	15	N=18								Firm light gray FINE SAND (SP) w/clay pockets & clayey sand layers	
[Diagonal Hatching]	20	3.5								Very stiff tan & light gray CLAY (CH)	
[Diagonal Hatching]	25	4.5+	16				43	15	28	Hard tan & gray SANDY CLAY (CL) -very stiff w/sand pockets @ 28'	
	30										
[Dotted]	35	N=19								Firm light gray & tan SLIGHTLY CLAYEY SAND (SC)	
[Diagonal Hatching]	40										

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE

11-4B-139

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
 Harris County, Texas

BORING NO. CB-13
 FILE NO. 83-180
 DATE 10/2/84

CLIENT: Western Contractors Services, Inc.
 Houston, Texas

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SOIL SYMBOL	FIELD DATA			LABORATORY DATA					DRY AUGERED	TO	FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET
								MINUS NO. 200 SIEVE - %			FREE WATER ENCOUNTERED	YES	NO
								Liquid	Plastic	Plasticity Index			
LL	PL	PI	DESCRIPTION OF STRATUM										
45												Firm tan & light gray SLIGHTLY CLAYEY SAND (SC)	
50			N=36									Firm red CLAYEY SILT (ML)	
55												Very stiff red-brown CLAY (CH)	
60			3.0	28			58	27	31				
65			4.0										
70			4.5+	20			46	19	27			Hard light gray SILTY CLAY (CL) w/sand pockets	
75			4.5+										
80			3.75	24			28	20	8			Firm gray & red CLAYEY SILT (ML) w/clay pockets	

* SLICKSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE III-4B-140
 ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-13
FILE NO. 83-180
DATE 10/2/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

FIELD DATA		LABORATORY DATA							DRY AUGERED TO FEET	WASH BORED TO FEET				
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED	YES	NO
								Liquid	Plastic	Plasticity Index				
												LL	PL	PI
DESCRIPTION OF STRATUM														
█	85	4.5+												Hard red SILTY CLAY (CL) -very silty @ 82'
█	90	4.0												Very stiff red CLAY (CH) w/sand layers
														Bottom @ 90'

• SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-141
ESTIMATED UNCONFINED COMPRESSIVE

PENETRATION RESISTANCE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
 Harris County, Texas

BORING NO. CB-14

FILE NO. 83-180

CLIENT: Western Contractors Services, Inc.
 Houston, Texas

DATE 10/2/84

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 25 FEET WASH BORED 25 TO 90 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index	AT 23.0 FT. DEPTH.	
											WATER AT 20.7 FT. AFTER 20 minutes	
LL	PL	PI	Minus No. 200 Sieve - %									
DESCRIPTION OF STRATUM												
4.5+										Firm light gray SILTY FINE SAND (SM) w/roots		
5										Hard tan & light gray SANDY CLAY (CL) -w/ferrous nodules & sand pockets @ 6' -very stiff, slightly sandy @ 8'		
4.5+			13				45	16	29			
10			3.25							-stiff, light gray @ 13'		
15			2.25									
20			3.75	20			53	20	33	Very stiff tan & light gray CLAY (CH) w/sand pockets -w/slickensides @ 23'		
25			4.5							-light gray & red w/claystones @ 28'		
30			4.5+									
35			91 10"							Very dense tan FINE SAND (SP)		
40												

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE III-4B-142
 ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-14
FILE NO. 83-180
DATE 10/2/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED	TO	FEET				
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET		
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED			YES	NO
											AT			FT. DEPTH.	
			WATER AT			FT. AFTER									
DESCRIPTION OF STRATUM															
											Very dense tan FINE SAND (SP)				
	45	X	N=68												
	50														
	55	X	N=60												
	60														
	65	X	50 4.5"								Very stiff tan & light gray CLAY (CH) w/calcareous nodules				
	70		3.0	19											
	75		4.5+	18			34	18	16		Hard tan & light gray SILTY CLAY (CL)				
	80		4.5+								Hard red CLAY (CH) w/silt & sand layers & slickensides				

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-14

CLIENT: Western Contractors Services, Inc.
Houston, Texas

FILE NO. 83-180

DATE 10/2/84

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED	TO	FEET
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED	YES	NO
LL	PL	PI	WATER AT	FT. AFTER									
DESCRIPTION OF STRATUM													
												Hard red CLAY (CH)	
	85			17				31	15	16		Very stiff red-brown SANDY CLAY (CL) w/clay pockets & layers	
	90	X	N=29	24								Very stiff red-brown CLAY (CH) w/sand pockets	
												Bottom @ 90'	

* SLICKSIDED FAILURE
() CONFINING PRESSURE PSI

• PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE

















LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-15
FILE NO. 83-180
DATE 10/1/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 90 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %
								Liquid	Plastic	Plasticity Index	
DESCRIPTION OF STRATUM											
	4.5+									Hard dark gray SANDY CLAY (CL)	
	4.5+	13					38	13	25	-very stiff, tan & gray w/calcareous & ferrous nodules @ 4'	
	5	4.25								-stiff, tan & light gray @ 6'	
	2.25										
	2.25										
	10										
	1.0									-very stiff w/crayfishholes & clay layers @ 3'	
	15	3.25	14				35	13	22		
	3.5										
	20										
			13							Dense tan & light gray CLAYEY SILT (ML) w/clay pockets & calcareous nodules	
	25										
											
	30	N=31								Dense tan & light gray FINE SAND (SP) -w/sandstones @ 31'	
	35										
	40									-w/clay layers @ 37'	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-145
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-15
FILE NO. 83-180
DATE 10/1/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						MINUS NO. 200 Sieve - %	DRY AUGERED TO FEET WASH BORED TO FEET	FREE WATER ENCOUNTERED YES NO AT FT. DEPTH. WATER AT FT. AFTER	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS					
								Liquid	Plastic				Plasticity Index
								LL	PL				PI
DESCRIPTION OF STRATUM													
Very dense tan FINE SAND (SP)													
	45	N=68											
	50												
	55	50 5.5"											
	60												
	65	4.0	30									-w/clay layer @ 62'-64'	
	70	3.5	19				45	16	29			Very stiff light brown & gray CLAY (CH)	
	75	4.0										-w/sand pockets & calcareous nodules @ 75'	
	80	3.5	21				33	18	15			Very stiff red-brown SILTY CLAY (CL) w/silt & clay pockets	

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
III-4B-146
ESTIMATED UNCONFINED COMPRESSIVE

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-15
FILE NO. 83-180
DATE 10/1/84

CLIENT: Western Contractors Services, Inc.
Houston, Texas

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED	TO	FEET				
	DEPTH (fact)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET				
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED	YES	NO				
														LL	PL	PI	
Minus No. 200 Sieve - %																	
DESCRIPTION OF STRATUM																	
			4.5+														Hard red CLAY (CH)
		85															-w/sand seams & pokcets & claystones @ 83'
			2.75														Very stiff red SILTY CLAY (CL) w/sand layers
		90															Bottom @ 90'





* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

ATTERBERG LIMITS
PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANDT 4B-147
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH FROM SPT OR TSF

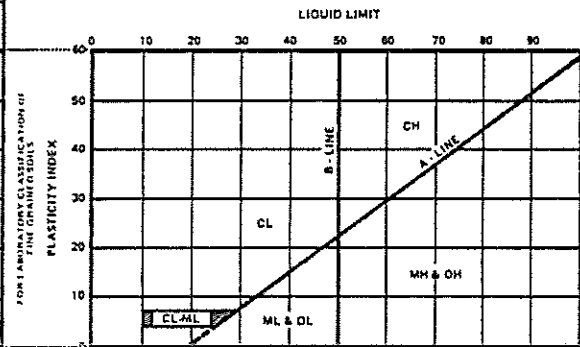
SYMBOLS AND TERMS USED ON BORING LOGS

MAJOR DIVISIONS		GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL GRADED GRAVELS, GRAVEL SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GP	POORLY GRADED GRAVELS, GRAVEL SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 200 SIEVE	CLEAN SAND (LITTLE OR NO FINES)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND SILT MIXTURES
	MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	CLEAN SAND (LITTLE OR NO FINES)	SC	CLAYEY SANDS, SAND SILT MIXTURE
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GC	CLAYEY GRAVELS, GRAVEL SAND CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS - FLOUR FLOUR SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
		LIQUID LIMIT GREATER THAN 50	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
		LIQUID LIMIT GREATER THAN 50	MH	INORGANIC SILTS, VICARIOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		LIQUID LIMIT GREATER THAN 50	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, MUDS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS
UNCLASSIFIED FILL MATERIALS				ARTIFICIALLY DEPOSITED EARTH AND/OR OTHER UNCLASSIFIED MATERIALS

SAMPLE TYPES

-  INDICATES DEPTH OF UNDISTURBED SAMPLE
-  INDICATES DEPTH OF STANDARD PENETRATION TEST
-  INDICATES DEPTH OF DISTURBED OR AUGER SAMPLE
-  INDICATES DEPTH OF SAMPLING ATTEMPT WITH NO RECOVERY

KEY TO SAMPLES (SHOWN IN SAMPLES COLUMN)



PLASTICITY CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOIL CLASSIFICATION CHART

UNIFIED SOIL CLASSIFICATION SYSTEM

RELATIVE DENSITY OF COHESIONLESS SOILS

COARSE GRAINED SOILS (major portion retained on No. 200 sieve): includes (1) clean gravels and sands, and (2) silty or clayey gravels and sands. Conditions rated according to standard penetration test (SPT) as performed in the field.

Descriptive Term	Blows Per Foot*
Very Loose	0 - 4
Loose	5 - 10
Firm	11 - 30
Dense	31 - 50
Very Dense	over 50

*140 pound weight having a free fall of 30 inches.

CONSISTENCY OF COHESIVE SOILS

FINE GRAINED SOILS (major portion passing No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength as indicated by penetrometer readings or by unconfined compression tests.

Descriptive Term	Unconfined Compressive Strength Ton/Sq. Ft.
Very Soft	Less than 0.25
Soft	0.25 to 0.50
Medium	0.50 to 1.00
Stiff	1.00 to 2.00
Very Stiff	2.00 to 4.00
Hard	4.00 and higher

NOTE: Slickensided and fissured clays may have lower unconfined compressive strengths than shown above, because of weakness or cracks in the soil. The consistency ratings of such soils are based on penetrometer readings.

TERMS CHARACTERIZING SOIL STRUCTURE

- Slickensided** — having inclined planes of weakness that are slick and glossy in appearance.
- Fissured** — containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
- Laminated** — composed of thin layers of varying color and texture.
- Interbedded** — composed of alternate layers of different soil types.
- Calcareous** — containing appreciable quantities of calcium carbonate.
- Well graded** — having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
- Poorly graded** — predominantly of one grain size, or having a range of sizes with some intermediate size missing.

MCBRIDE RATCLIFF ASSOCIATES
1983

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-1C
FILE NO. 83-180
DATE 9/6/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 10 FEET WASH BORED 10 TO 90 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED YES NO		
								Liquid	Plastic	Plasticity Index		AT		
												FT. DEPTH.		
LL	PL	PI	WATER AT			FT. AFTER								
DESCRIPTION OF STRATUM														
														Stiff dark brown SANDY CLAY (CL) "FILL" w/building debris
														Firm dark gray FINE SAND (SP) "FILL"
	5		4.5+											Hard light gray & tan SANDY CLAY (CL) -tan & gray w/ferrous nodules @ 6'
			4.5+	10				43	15	28				-w/clay pockets & sand streaks @ 8'
	10		4.5+											
			4.5+											Dense light gray & tan CLAYEY SAND (SC)
	15		4.5+											
			N=44											Dense light gray & tan FINE SAND (SP)
	20													
														-firm @ 28'
	25													
			N=27											-w/clay layers @ 34'-35'
	30													
														-light gray @ 38'
	35													
			N=21											
	40													

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

II-4B-149

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-1C
FILE NO. 03-180
DATE 9/6/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED		TO FEET -			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			TO	FEET			
								Liquid	Plastic	Plasticity Index			TO	FEET	
													FREE WATER ENCOUNTERED	YES	NO
													AT	FT. DEPTH.	
													WATER AT	FT. AFTER	
													DESCRIPTION OF STRATUM		
													Firm light gray FINE SAND (SP)		
	45												Stiff red & light gray CLAY (CH) w/calcareous nodules		
	50		N=78										Very dense light gray FINE SAND (SP)		
	55												-clay layers @ 57'		
	60		N=85 10.5"												
	65														
	70		3.0	28				56	22	34			Very stiff red & gray CLAY (CH)		
	75												Hard tan & gray SANDY CLAY (CL) w/sand layers & pockets		
	80		4.5+	17				30	15	15					

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
 Harris County, Texas

CLIENT: Western Contractors Services, Inc.
 Houston, Texas

BORING NO. CB-1C
 FILE NO. 83-180
 DATE 9/6/83

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							DRY AUGERED	TO	FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (t) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			WASH BORED	TO	FEET		
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED			YES	NO
											LL	PL	PI	AT	FT. DEPTH.
												DESCRIPTION OF STRATUM			
												Hard tan & gray SANDY CLAY (CL) w/sand layers & pockets			
	85											Hard red SILTY CLAY (CL) w/clay & sand pockets			
	90		4.5+	23				36	20	16					
												Bottom @ 90'			

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-20
FILE NO. 83-180
DATE 8/31/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Approx. Elev. 105'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						Minus No. 200 Sieve - %	DRY AUGERED 0 TO 40 FEET WASH BORED 40 TO 100 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO		
								LL		PL		PI	AT 37.0 FT. DEPTH.
	4.5+										Stiff brown & gray SANDY CLAY (CL) w/shell, asphalt, gravel & "FILL" crushed limestone -hard, gray, w/sand layers @ 2'		
	5										Hard tan & light gray SANDY CLAY (CL) w/clay pockets -w/sand pockets @ 6'		
	4.5+												
	4.5+	11						38	15	23			
	10												
	N=17										Firm light gray FINE SAND (SP) w/slightly clayey sand layers		
	15												
	N=30										Hard tan & light gray SANDY CLAY (CL)		
	20												
	4.5+										Hard tan & light gray CLAY (CH) w/many calcareous nodules & sand pockets		
	25												
	4.5+	11						31	15	16			
	30										Hard light gray SANDY CLAY (CL) w/many calcareous nodules		
	35										Hard red & light gray CLAY (CH)		
	4.5+												
	N=84										Very dense tan & light gray FINE SAND (SP)		
	40												

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT III-4B-152

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-2C
FILE NO. 83-180
DATE 8/31/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Page 2

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED	TO	FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET	
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED		YES	NO
											LL	PL	PI	AT
	45													
	50	N=50 5"												
	55													
	60		4.5+	27				50	21	29				
	65													
	70		4.0											
	75													
	80		2.5	24				31	20	11				

DESCRIPTION OF STRATUM

Very dense tan & light gray FINE SAND (SP)

-tan @ 48'

Hard red CLAY (CH)

Very stiff light gray & red VERY SILTY CLAY (CL)
-w/clay & sandy silt layers

• SLICKSIDED FAILURE () CONFINING PRESSURE, PSI G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT) TSF - POCKET PENETROMETER OR TORVANE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

PENETRATION RESISTANCE III-4B-153

LOG OF BORING

PROJECT: Crawford Street Type IV Landfill
Harris County, Texas

BORING NO. CB-2C
FILE NO. 83-180
DATE 8/31/83

CLIENT: Western Contractors Services, Inc.
Houston, Texas

Page 3

FIELD DATA			LABORATORY DATA						DRY AUGERED	TO	FEET				
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORED	TO	FEET		
								Liquid	Plastic	Plasticity Index	Minus No. 200 Sieve - %	FREE WATER ENCOUNTERED		YES	NO
												AT		FT. DEPTH.	
												WATER AT		FT. AFTER	
LL	PL	PI	DESCRIPTION OF STRATUM												
												Very stiff red & light gray VERY SILTY CLAY (CL) w/clay & sandy silt layers			
	85											Hard red CLAY (CH)			
			1.0	24				22	12	10		Firm red SANDY SILT (ML) w/clay pockets			
	90		4.5+									Hard red VERY SILTY CLAY (CL)			
												Hard light gray & red CLAY (CH) w/silt seams			
	95														
			4.5+	29											
	100											Bottom @ 100'			

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

TSF - STANDARD PENETRATION RESISTANCE (SPT)
POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-154

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-2T
FILE NO. 80-269
DATE 1/9/81

Approx. Elev: 101 8'

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 60 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES <u>NO</u> AT _____ FT. DEPTH. WATER AT _____ FT. AFTER
								Liquid	Plastic	Plasticity Index	
DESCRIPTION OF STRATUM											
[Pattern]	4.5+										Hard dark gray SANDY CLAY (CL) tan & gray w/sand pockets @ 2'
	4.0	12					36	17	19		
	5	4.5+									
	4.5+										
	10	4.5+									
[Pattern]	15	4.5+	17								Hard red & light gray CLAY (CH) w/calcareous nodules
	20	4.5+									
	25	4.5+									
	30	4.5+									
[Pattern]	35	4.5+	22				51	24	27		Dense red very SILTY FINE SAND (SM-ML)
	40										

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-2T
FILE NO. 80-269
DATE 1/9/81

Approx. Elev: 101 8' Page 2

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 30 FEET		WASH BORED 30 TO 60 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES <u>NO</u>			
								Liquid	Plastic	Plasticity Index	AT FT. DEPTH.			
											WATER AT FT. AFTER			
LL	PL	PI	DESCRIPTION OF STRATUM											
			N=49										Dense red very SILTY FINE SAND (SM-ML)	
	45		N=64		-200=66%								Dense red SANDY SILT (ML)	
	50		N=43		-200=22%								Dense red SILTY FINE SAND (SM)	
	55		4.5										Very stiff red CLAY (CH)	
	60												Bottom @ 60'	

• SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE 11-4B-156
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CB-10E
FILE NO. 82-002
DATE 4/5/82

CLIENT: BSI Construction Services
Houston, Texas

Approx. Elev: 107.6'

FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 30 FEET		WASH BORED 30 TO 50 FEET		
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (ft) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED	YES	NO
								Liquid	Plastic	Plasticity Index			
								LL	PL	PI	AT	FT. DEPTH.	WATER AT
DESCRIPTION OF STRATUM													
[Diagonal Hatching]	1.0											Stiff tan & gray SANDY CLAY (CL) w/sand pockets & streaks @ 13'	
	1.5												
	5												
	4.0			8			31	18	13				
	4.0												
[Diagonal Hatching]	10												
	4.5												
	15			14			29	17	12				
	2.0												
	15												
[Dotted Pattern]	20	X	N=22									Firm tan & light gray SLIGHTLY SILTY SAND (SM)	
	25	X	N=24			-200 =12%							
	30	X	N=55										
	35	X	N=60										
	40	X	N=53										

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE III-4B-157
STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CB-10E
FILE NO. 82-002
DATE 4/5/82

CLIENT: BSI Construction Services
Houston, Texas

Approx. Elev: 107.6'

Page 2

FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET			
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES <u>NO</u>		
								Liquid	Plastic	Plasticity Index	AT _____ FT. DEPTH.		
								LL	PL	PI	WATER AT _____ FT. AFTER		
DESCRIPTION OF STRATUM													
(SP)	45	N=32											Dense tan & light gray SAND (SP)
	50	N=50											
													Bottom @ 50'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
INI - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-158
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

AVILES ENGINEERING
1982

PROJECT 21.3604 ACRE TRACT

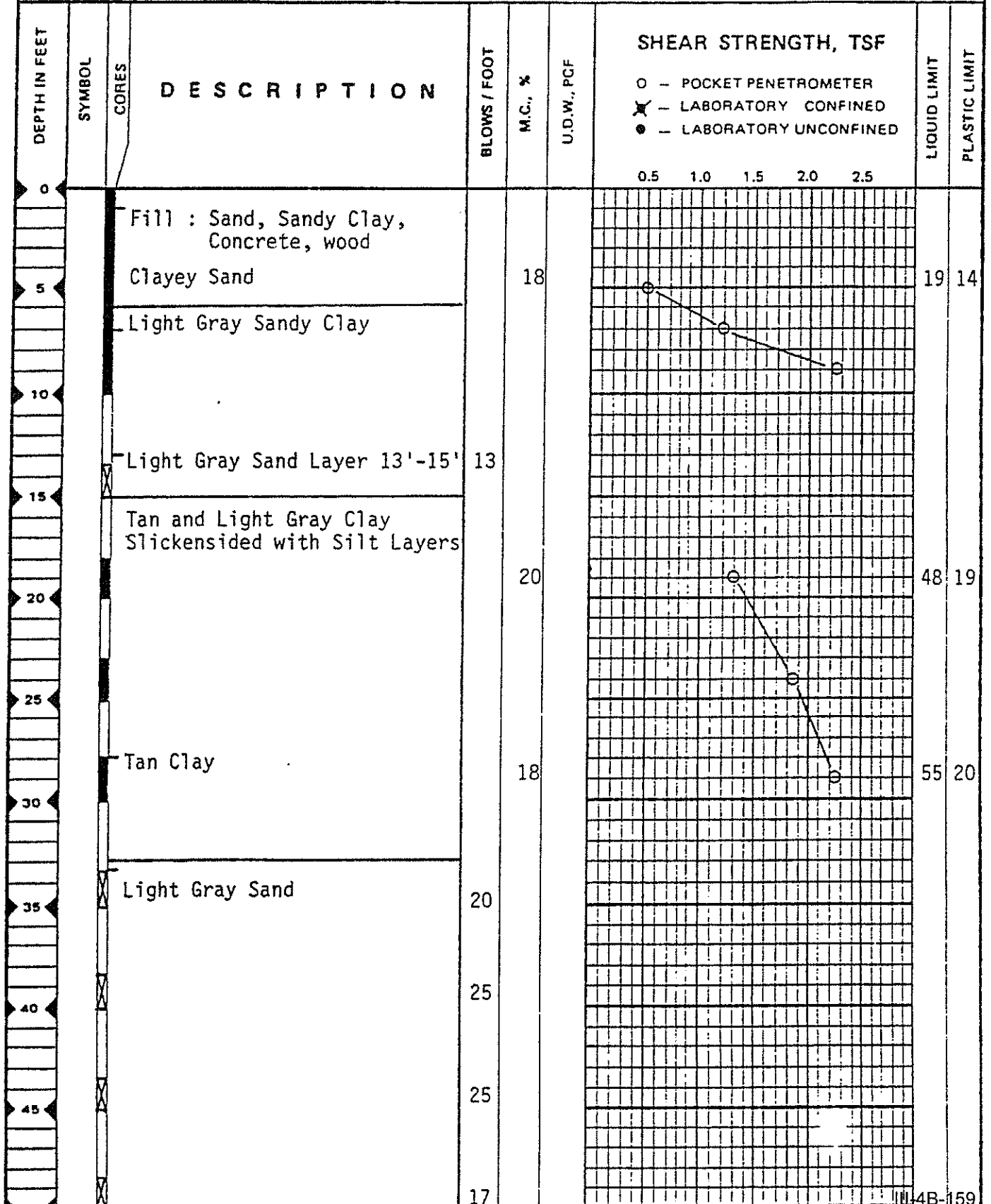
BORING B-1

DATE 10/07/82

TYPE 3" CORE

LOCATION SEE PLAN

103



PROJECT 21.3604 ACRE TRACT

BORING B-1

DATE 10/07/82

TYPE 3" CORE

LOCATION SEE PLAN

DEPTH IN FEET	SYMBOL	CORES	DESCRIPTION	BLOWS / FOOT	M.C., %	U.D.W., PCF	SHEAR STRENGTH, TSF					LIQUID LIMIT	PLASTIC LIMIT
							0.5	1.0	1.5	2.0	2.5		
50			Light Gray Sand										
55		X		27									
60		X		26									
65			Bottom @ 60'										
70			1. Boring drilled to 30' without drilling fluid.										
75			2. Water encountered at 33'										
80													
85													

PROJECT 21.3604 ACRE TRACT

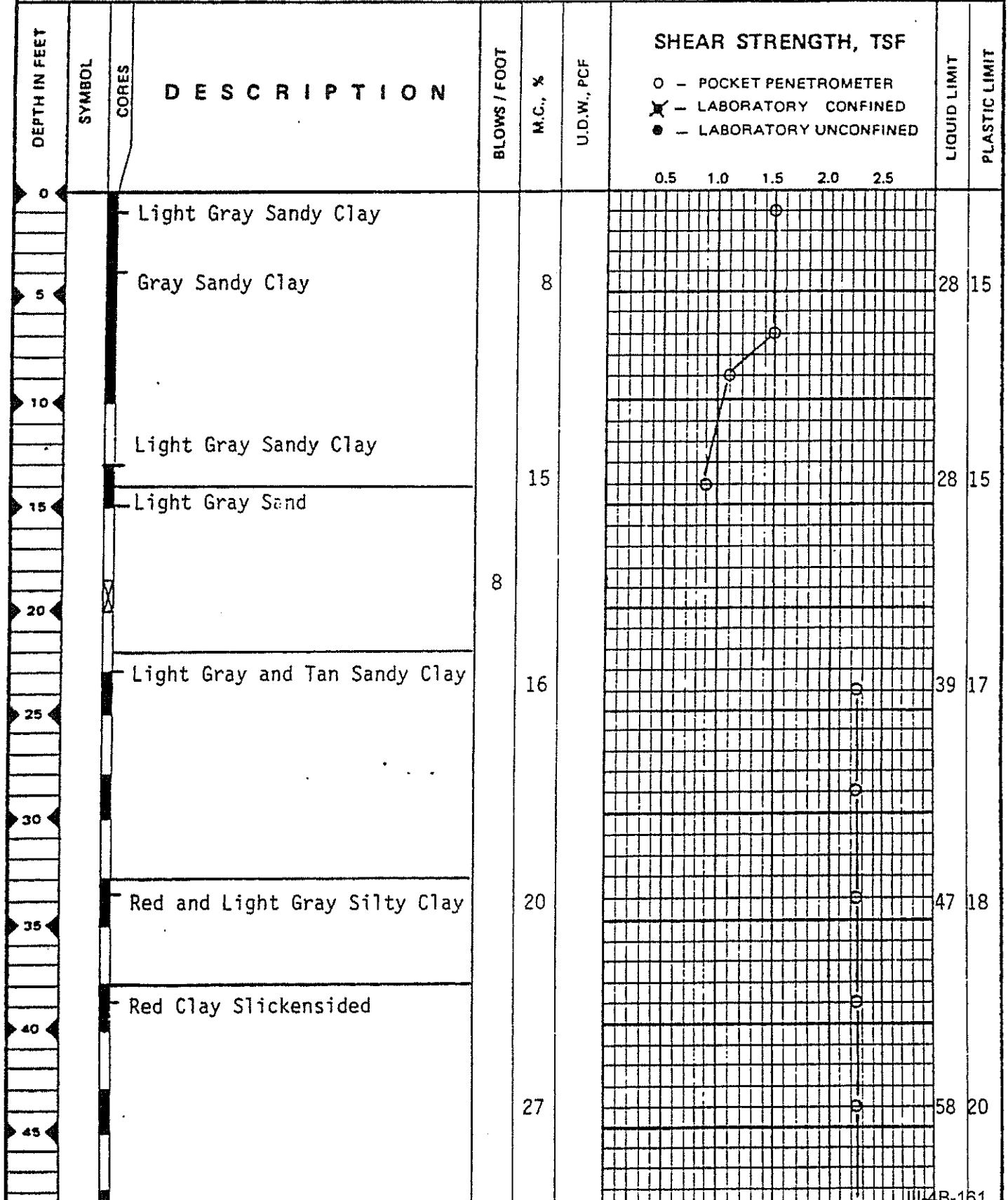
BORING B-2

DATE 10/05/82

TYPE 3" CORE

LOCATION SEE PLAN

102



PROJECT 21.3604 ACRE TRACT

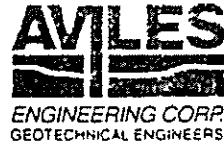
BORING B-2

DATE 10/05/82

TYPE 3" CORE

LOCATION SEE PLAN

DEPTH IN FEET	SYMBOL	CORES	DESCRIPTION	BLOWS / FOOT	M.C., %	U.D.W., PCF	SHEAR STRENGTH, TSF					LIQUID LIMIT	PLASTIC LIMIT
							0.5	1.0	1.5	2.0	2.5		
50			Red and Light Gray Clay										
55			Tan Sand	22									
60				29									
65			Bottom @ 60'										
70			1. Boring drilled to 30' without drilling fluid. 2. Water encountered at 52' while drilling.										



PROJECT 21.3604 ACRE TRACT

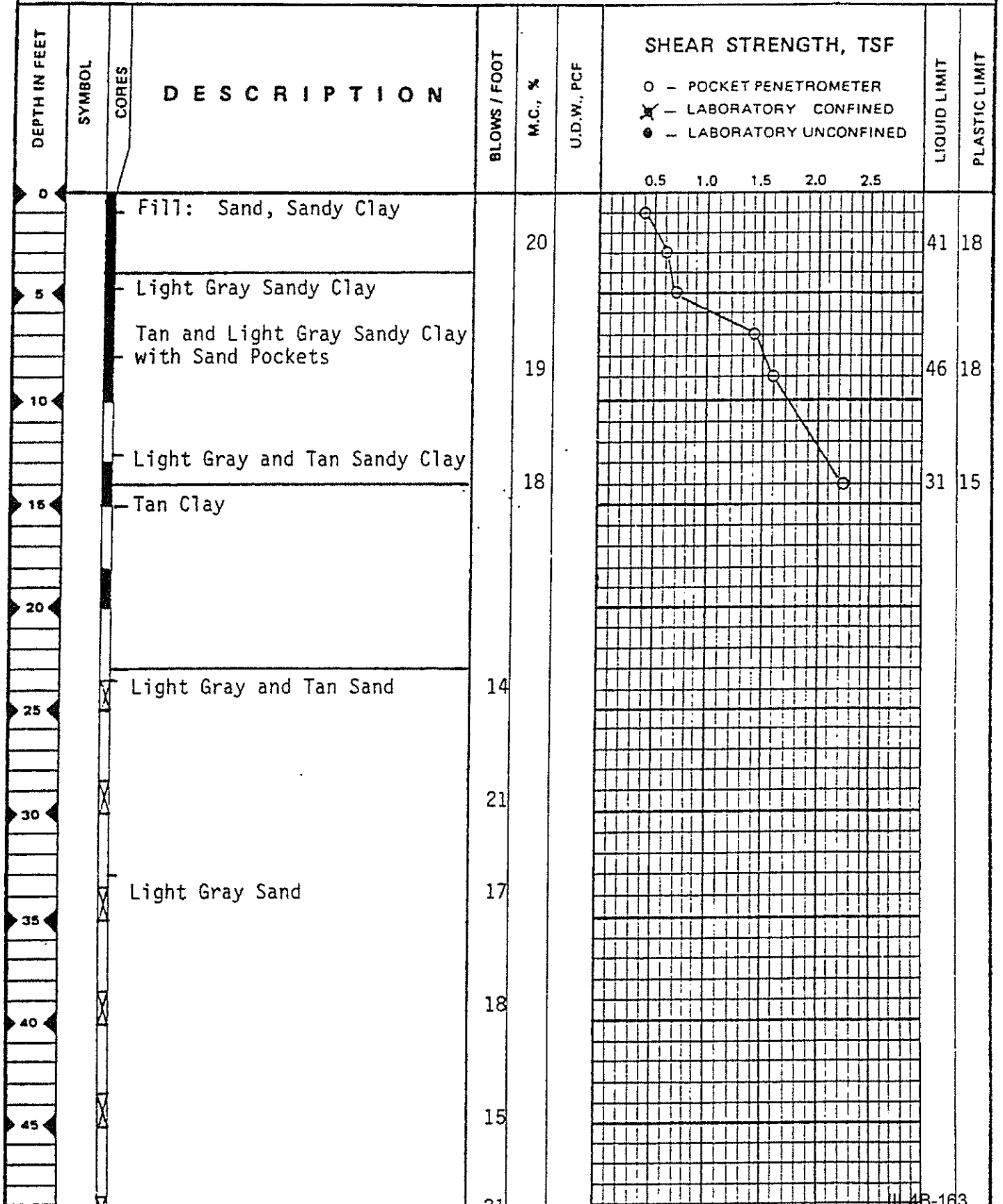
BORING B-3

DATE 10/04/82

TYPE 3" CORE

LOCATION SEE PLAN

150



PROJECT 21. 3604 ACRE TRACT

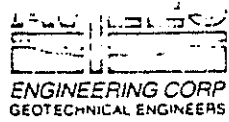
BORING B-3

DATE 10/04/82

TYPE 3" CORE

LOCATION SEE PLAN

DEPTH IN FEET	SYMBOL	CORES	DESCRIPTION	BLOWS / FOOT	M.C., %	U.D.W., PCF	SHEAR STRENGTH, TSF					LIQUID LIMIT	PLASTIC LIMIT
							0.5	1.0	1.5	2.0	2.5		
50													
55			Tan Sand	33									
60			Bottom @ 60'	36									
65			1. Boring drilled to 20' without drilling fluid.										
70			2. Water encountered at 43'										
75													



PROJECT 21.3604 ACRE TRACT

DATE 12-18-82 & 1-9-83 TYPE 3" CORE

BORING B-3

SEE PLAN

LOCATION

DEPTH IN FEET	SYMBOL	CORES	DESCRIPTION	BLOWS / FOOT	M.C., %	U.D.W., PCF	SHEAR STRENGTH, TSF					LIQUID LIMIT	PLASTIC LIMIT
							0.5	1.0	1.5	2.0	2.5		
60			Tan sand										
65			Red clay										
70			Light gray and red clay with silt seams										
75													
80			Red and light gray silty clay										
85			Red clay										
90													
95			Light gray and tan clay										
100			Bottom at 100'										
			1. Boring washed to 60'										
			2. Coring started at 60'										

PROJECT 21.3604 ACRE TRACT

BORING B-4

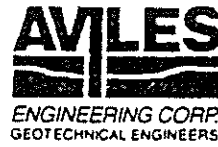
DATE 10/05/82

TYPE 3" CORE

LOCATION SEE PLAN

103

DEPTH IN FEET	SYMBOL	CORES	DESCRIPTION	BLOWS / FOOT	M.C., %	U.D.W., PCF	SHEAR STRENGTH, TSF					LIQUID LIMIT	PLASTIC LIMIT
							0.5	1.0	1.5	2.0	2.5		
0			Fill: Sand, Concrete, asphalt, Sandy Clay, Clay										
5			Light Gray and Tan Sandy Clay 64% Passing No. 200	14								50	19
10			Light Gray Sand										
15				34									
20			Light Gray and Tan Sandy Clay 72% Passing No. 200 Sieve	21									
25													
30			Light Gray And Tan Sand	16									
35				16									
40				22									
45				19									



PROJECT 21.3604 ACRE TRACT

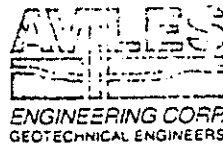
BORING B-4

DATE 10/05/82

TYPE 3" CORE

LOCATION SEE PLAN

DEPTH IN FEET	SYMBOL	CORES	DESCRIPTION	BLOWS / FOOT	M.C., %	U.D.W., PCF	SHEAR STRENGTH, TSF					LIQUID LIMIT	PLASTIC LIMIT
							0.5	1.0	1.5	2.0	2.5		
50													
55		X	Tan Sand	25									
60		X		28									
65			Bottom @ 60'										
70			1. Boring drilled to 30' without drilling fluid.										
75			2. Water encountered at 52' while drilling.										



PROJECT 21.3604 ACRE TRACT

BORING B-4

DATE 12/18/82 & 1/9/83 TYPE 3" CORE

LOCATION SEE PLAN

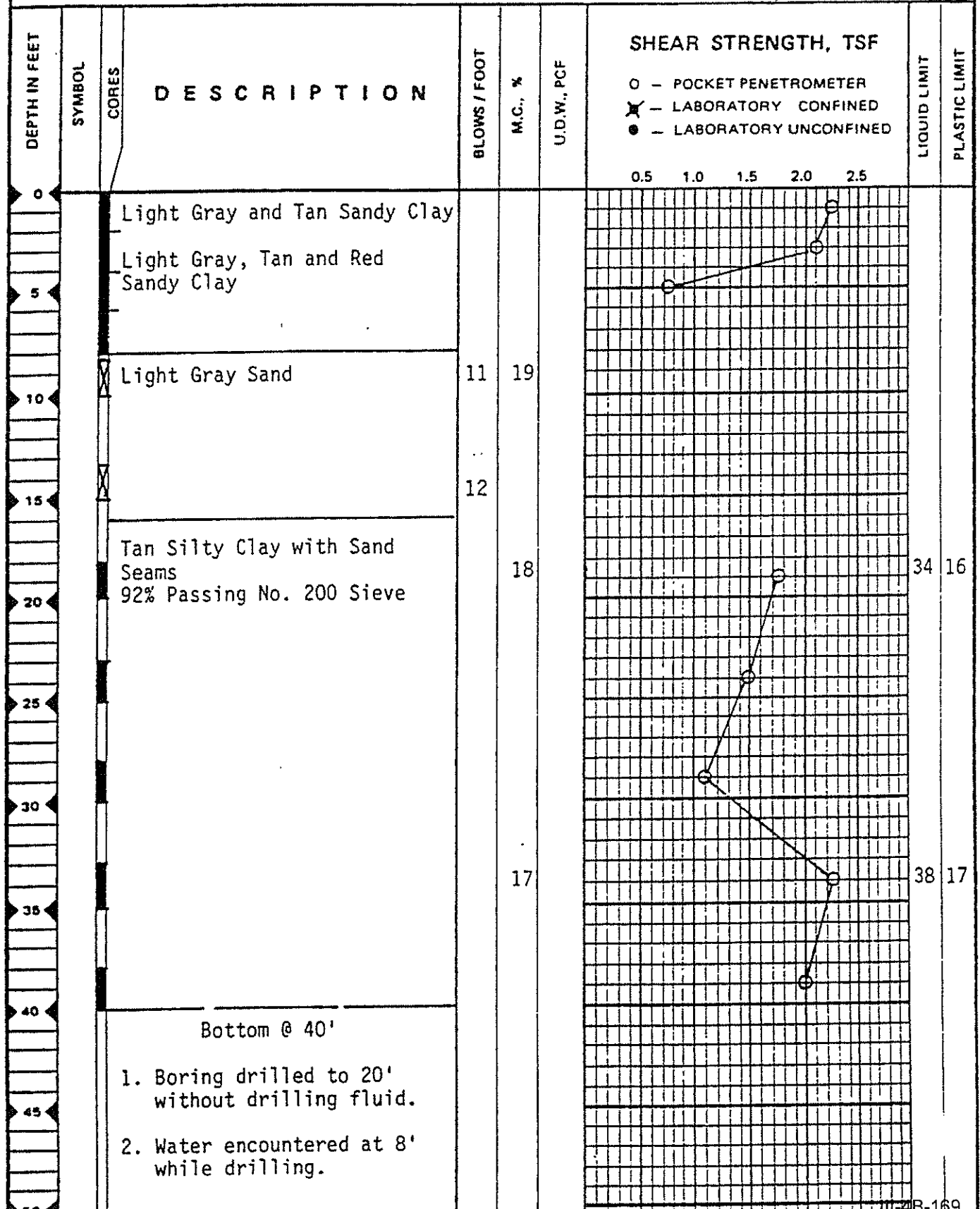
DEPTH IN FEET	SYMBOL	CORES	DESCRIPTION	BLOWS / FOOT	M.C., %	U.D.W., PCF	SHEAR STRENGTH, TSF					LIQUID LIMIT	PLASTIC LIMIT
							0.5	1.0	1.5	2.0	2.5		
60			Tan sand										
65			Red clay										
70													
75			Light gray and red silty clay										
80													
85			Red clay										
90			Light gray, tan and red clay										
95													
100			Bottom at 100'										
			1. Boring washed to 60'										
			2. Coring started at 60'										

PROJECT 21.3604 ACRE TRACT

BORING B-5

DATE 9/30/82 TYPE 3" CORE

LOCATION SEE PLAN

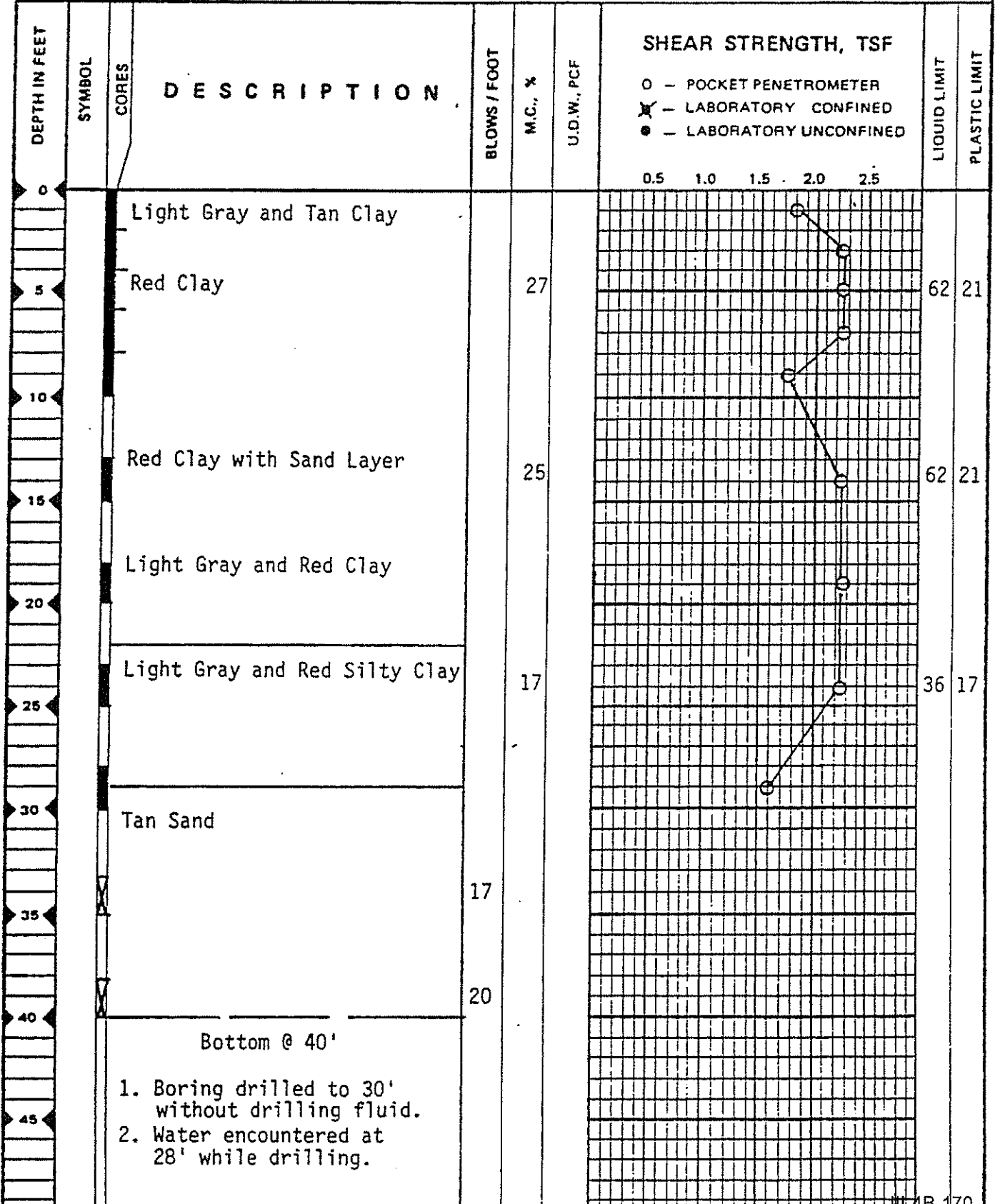


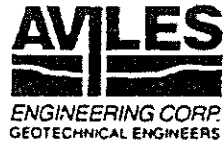
PROJECT 21.3604 ACRE TRACT

BORING B-6

DATE 9/28/82 TYPE 3" CORE

LOCATION SEE PLAN





PROJECT 21.3604 ACRE TRACT

BORING B-7

DATE 9/30/82

TYPE 3" Core

LOCATION See Plan

55

DEPTH IN FEET	SYMBOL	CORES	DESCRIPTION	BLOWS / FOOT	M.C., %	U.D.W., PCF	SHEAR STRENGTH, TSF					LIQUID LIMIT	PLASTIC LIMIT
							0.5	1.0	1.5	2.0	2.5		
0			Fill: sandy clay, sand, concrete, sandstones										
5													
10			Light gray and tan sand	11									
18			Red silty clay with silt layers	20							31	15	
20			Red and light gray clay										
25													
30			Red and light gray clay	23							58	20	
35			3" sand layer @ 34'										
40			Bottom @ 40'										
45			1. Boring drilled to 20' without drilling fluid. 2. Water encountered at 7' while drilling.										

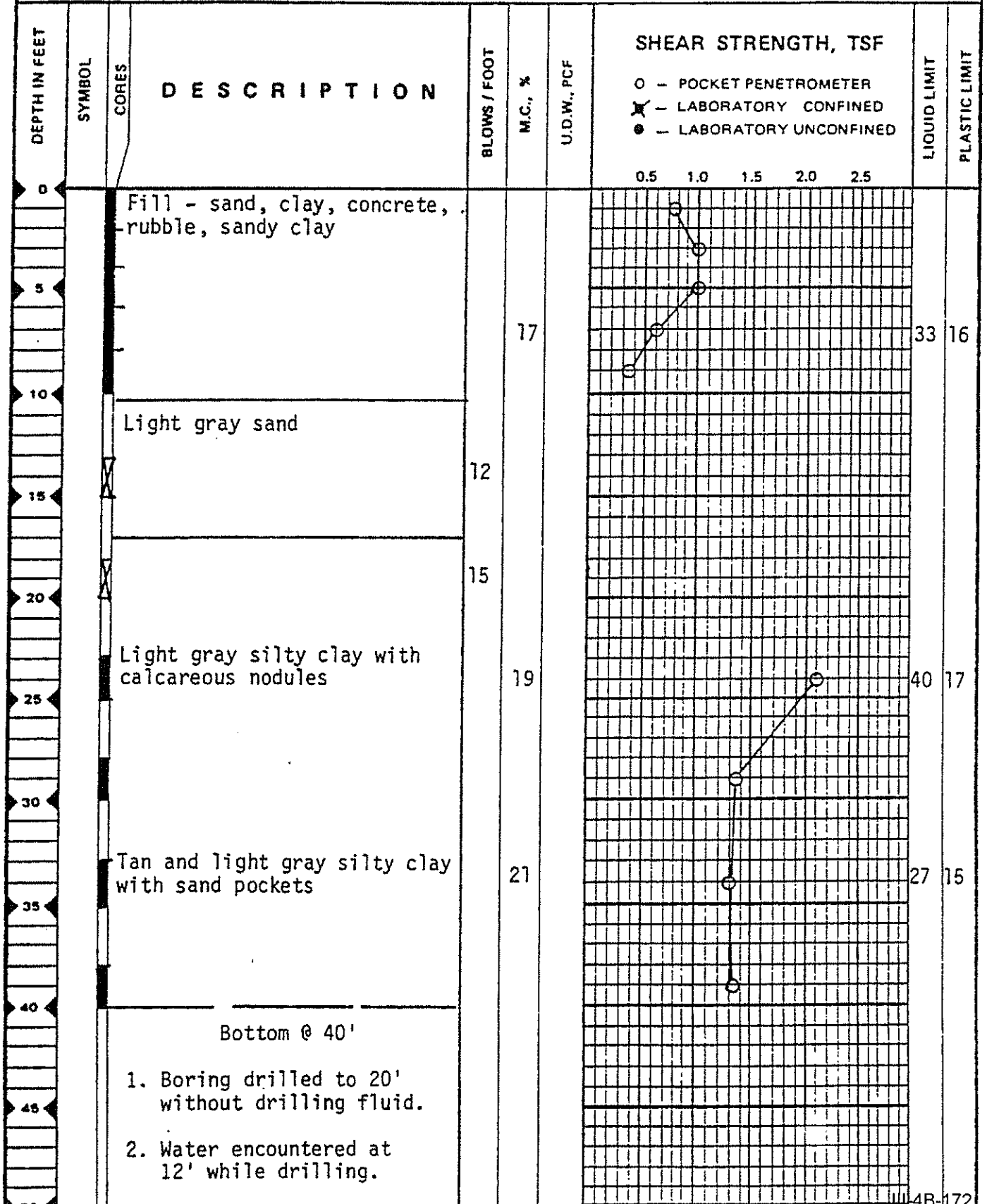
PROJECT 21.3604 ACRE TRACT

BORING B-8

DATE 9/29/82

TYPE 3" Core

LOCATION See Plan



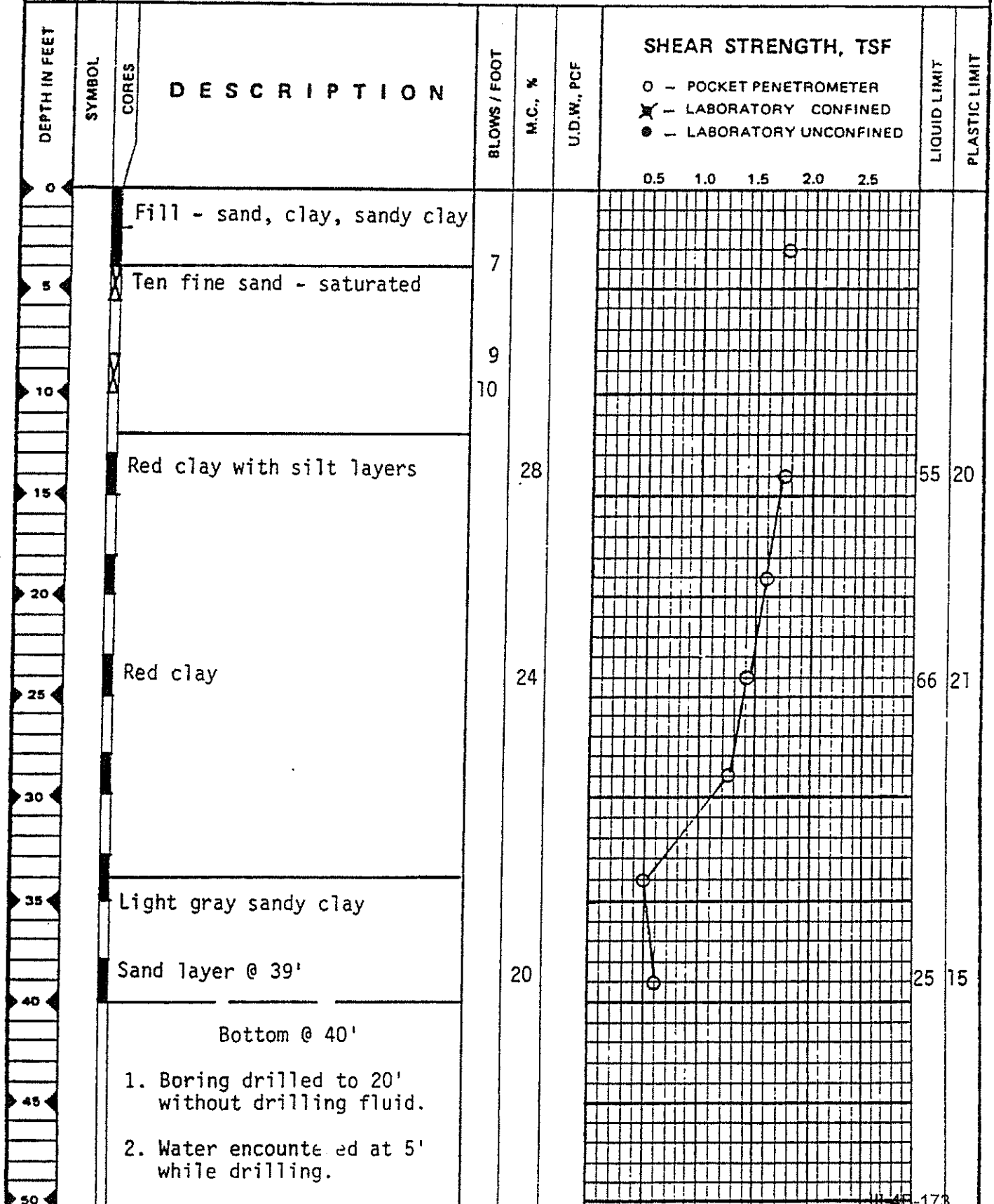
PROJECT 21.3604 ACRE TRACT

BORING B-9

DATE 9/30/82

TYPE 3" Core

LOCATION See Plan



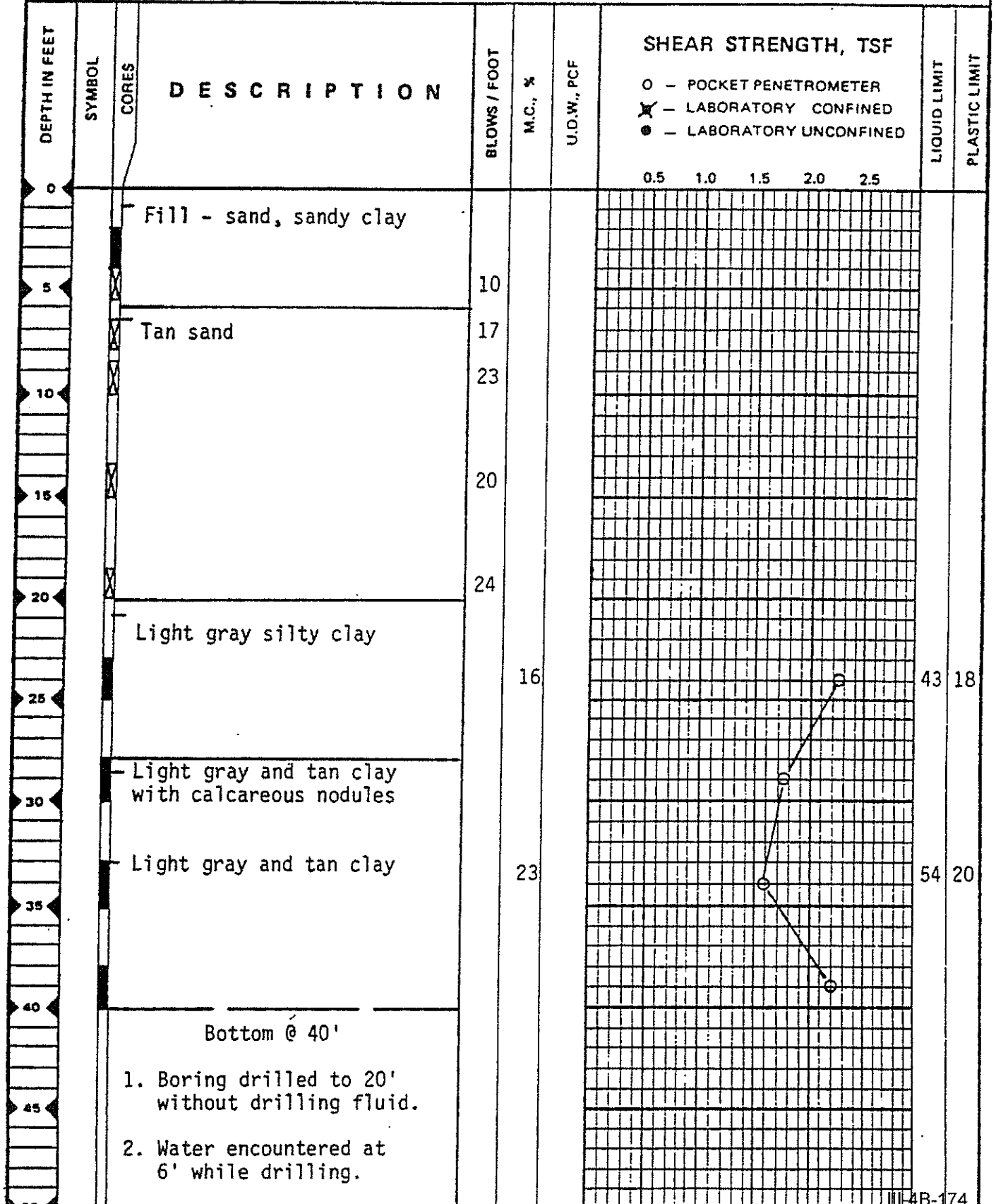
PROJECT 21.3604 Acre Tract

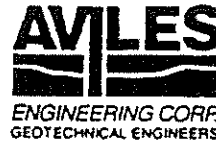
BORING B-10

DATE 10/4/82

TYPE 3" Core

LOCATION See Plan





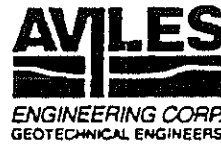
PROJECT 21.3604 ACRE TRACT

BORING B-11

DATE 10/04/82 TYPE 3" CORE

LOCATION SEE PLAN

DEPTH IN FEET	SYMBOL	CORES	DESCRIPTION	BLOWS / FOOT	M.C., %	U.D.W., PCF	SHEAR STRENGTH, TSF					LIQUID LIMIT	PLASTIC LIMIT
							0.5	1.0	1.5	2.0	2.5		
0			Tan and Light Gray Sand	5									
5				12									
10				19									
15				14									
20				21									
25			Red Clay Slickensided with Silt Seams	21									
30				27							62	21	
35			Light Gray Silty Clay Layer with Sand Seams 33'-35'	17							35	17	
40			Bottom @ 40'										
45			1. Boring drilled to 20' without drilling fluid. 2. Water encountered at 13' while drilling.										



PROJECT 21.3604 ACRE TRACT

BORING B-12

DATE 9/30/82

TYPE 3" CORE

LOCATION SEE PLAN

DEPTH IN FEET	SYMBOL	CORES	DESCRIPTION	BLOWS / FOOT	M.C., %	U.D.W., PCF	SHEAR STRENGTH, TSF					LIQUID LIMIT	PLASTIC LIMIT
							0.5	1.0	1.5	2.0	2.5		
0			Light Gray and Tan Sandy Clay										
5			Light Gray and Tan Sand	11									
10				12									
15				14									
20			Red Clay with Silt Layers	14									
25				17									
30			Red Clay with Silt Layers	25							53	19	
35													
40			Red Clay with Silt Layers	24							47	18	
45													
45			Bottom @ 40'										

1. Boring drilled to 20' without drilling fluid.
2. Water encountered at 13' while drilling.

MCBRIDE RATCLIFF ASSOCIATES
1981 - 1982

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-1
FILE NO. 80-269
DATE 1/5/81

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 30 FEET		WASH BORED 30 TO 50 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid	Plastic	Plasticity Index	AT 26.0 FT. DEPTH.	
											LL	PL
DESCRIPTION OF STRATUM												
	4.5+										Hard dark gray SANDY CLAY (CL) very stiff 2-4' calcareous nodules @ 4' stiff 6-8' very stiff, tan & gray @ 8'	
	4.5											
	2.5											
	5	1.75	18				32	15	17			
		2.5										
		3.5										
	10											
	15	3.75									Very stiff red & light gray CLAY (CH) w/calcareous nodules	
	20	4.5					44	19	25		Very stiff light tan & red SANDY CLAY (CL) w/clay pockets	
	25	4.5+									Hard red & light gray CLAY (CH) w/calcareous nodules	
	30	4.5+	18	116	4.78	5					Stiff red & light gray SILTY CLAY (CL) Hard red & light gray CLAY (CH)	
	35	4.5+										
	40										Very dense red very SILTY FINE SAND (SM)	

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-177

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-1
FILE NO. 80-269
DATE 1/5/81

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid	Plastic	Plasticity Index		AT 26.0 FT. DEPTH.
DESCRIPTION OF STRATUM												
	45	X	N=50 6"			G.S.					Very dense red very SILTY FINE SAND (SM)	
	50	X									Bottom @ '50'	

• SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-178

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-2
FILE NO. 80-269
DATE 1/9/81

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 60 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES <u>NO</u> AT _____ FT. DEPTH. WATER AT _____ FT. AFTER
								Liquid	Plastic	Plasticity Index	
DESCRIPTION OF STRATUM											
[Patterned]	4.5+									Hard dark gray SANDY CLAY (CL) tan & gray w/sand pockets @ 2'	
	4.0	12					36	17	19		
	5	4.5+									
		4.5+									
		4.5+									
		4.5+									
[Patterned]	15	4.5+	17							Hard red & light gray CLAY (CH) w/calcareous nodules	
	20	4.5+									
	25	4.5+									
	30	4.5+									
	35	4.5+	22				51	24	27		
[Patterned]	40									Dense red very SILTY FINE SAND (SM-ML)	

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE III-4B-179
STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

BORING NO. CB-2
 FILE NO. 80-269
 DATE 1/9/81

Page -2-

PROJECT: 15 Acre Landfill
 Tanner Road
 CLIENT: BSI Construction Services
 Houston, Texas

DRY AUGERED 0 TO 30 FEET
 WASH BORED 30 TO 60 FEET

FREE WATER ENCOUNTERED YES NO
 AT _____ FT. DEPTH.
 WATER AT _____ FT. AFTER

LABORATORY DATA

SOIL SYMBOL	FIELD DATA		LABORATORY DATA							
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain, %	ATTERBERG LIMITS		
								Liquid	Plastic	Plasticity Index
							LL	PL	PI	
	45		N=49							
	50		N=64			-200=66%				
	55		N=43			-200=22%				
	60		4.5							

DESCRIPTION OF STRATUM
 Dense red very SILTY FINE SAND (SM-ML)

Dense red SANDY SILT (ML)

Dense red SILTY FINE SAND (SM)

Very stiff red CLAY (CH)

Bottom @ 60'

• SLICKSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

• PENETRATION RESISTANCE
 (N) - STANDARD PENETROMETER OR TORVANE
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-3
FILE NO. 80-269
DATE 1/5/81

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO			
								Liquid	Plastic	Plasticity Index	AT 28.0 FT. DEPTH.			
											WATER AT _____ FT. AFTER _____			
LL	PL	PI	DESCRIPTION OF STRATUM											
	4.5+													Hard dark gray very SANDY CLAY "FILL"
	4.5+													Hard gray SANDY CLAY (CL) w/calcareous nodules very stiff, tan & gray @ 4'
	5	3.0												
		3.25												
	10	3.75												
	15	4.5	21											Hard red & light gray CLAY (CH)
	20	4.5+	15											Hard tan & red SANDY CLAY (CL)
	25	4.5+												Hard red & light gray CLAY (CH)
	30	4.5+												Hard red & light gray SILTY CLAY (CL)
	35	4.5+	22	106	1.42*	2	60	26	34					Hard red & light gray CLAY (CH)
	40	4.5+												

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-181
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
 Tanner Road
 CLIENT: BSI Construction Services
 Houston, Texas

BORING NO. CB-3
 FILE NO. 80-269
 DATE 1/5/81
 Page -2-

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid	Plastic	Plasticity Index		
								LL	PL			PI
DESCRIPTION OF STRATUM												
											Hard red & light gray CLAY (CH)	
											Very dense red very SILTY FINE SAND (SM)	
	45	N=50 6"									firm @ 48'	
	50	N=26									Bottom @ 50'	

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE III-4B-182
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-4
FILE NO. 80-269
DATE 1/9/81

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 42 FEET WASH BORED TO FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO AT 42.0 FT. DEPTH. WATER AT FT. AFTER
								Liquid	Plastic	Plasticity Index	
								LL	PL	PI	
DESCRIPTION OF STRATUM											
	4.5+										Hard dark gray very SANDY CLAY "FILL"
	4.5+										Hard tan & gray SANDY CLAY (CL) w/calcareous nodules very stiff below 6'
5	2.0										
	1.5										
	2.75										
	4.0										Very stiff red & tan CLAY (CH)
15											
	4.5+	15					41	16	25		Hard tan & gray SANDY CLAY (CL) w/calcareous nodules
20											
	4.5+										Hard red & gray CLAY (CH) w/calcareous nodules
25											
	4.5+										
30											
	4.5+	18					48	23	25		
35											
	4.5+										
40											

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-183

LOG OF BORING

PROJECT:

15 Acre Landfill
Tanner Road

BORING NO. CB-4

FILE NO. 80-269

CLIENT:

BSI Construction Services
Houston, Texas

DATE 1/9/81

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FIELD DATA		LABORATORY DATA					DRY AUGERED 0 TO 42 FEET WASH BORED TO FEET				
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO AT 42.0 FT. DEPTH. WATER AT _____ FT. AFTER
								Liquid	Plastic	Plasticity Index	
								LL	PL	PI	
DESCRIPTION OF STRATUM											
										Hard red & gray CLAY (CH)	
	45									Bottom @ 42'	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-184
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH TONS PER SQ. FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-5
FILE NO. 80-269
DATE 1/5/81

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 35 FEET WASH BORED TO FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid	Plastic	Plasticity Index		AT 15.0 FT. DEPTH.
DESCRIPTION OF STRATUM												
4.5+											Hard red & light gray CLAY (CH) w/clay stones	
4.5+												
5-		4.5+	23				57	23	34			
4.5+												
4.5+												
10-											Firm to dense red SANDY SILT (ML)	
15-	N=12				-200=84%							
20-	N=50 10"											
											Bottom @ 20'	

• SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-185
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-6
FILE NO. 80-269
DATE 1/9/81

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 35 FEET WASH BORED TO FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO AT 27.0 FT. DEPTH. WATER AT FT. AFTER
								Liquid	Plastic	Plasticity Index	
								LL	PL	PI	
DESCRIPTION OF STRATUM											
[Diagonal Hatching]	4.5+										Hard dark gray SANDY CLAY (CL) w/ferrous nodules stiff & gray w/calcareous material below 2' gray & tan below 8'
	2.5										
	5	2.75									
		2.25									
		3.0									
	10										
[Diagonal Hatching]	15	4.0									Very stiff tan & light gray CLAY (CH) w/calcareous nodules
	20	4.5+									Hard tan & light gray SANDY CLAY (CL) w/calcareous material
[Diagonal Hatching]	25	4.5+									
	30	4.5+									Hard red & light gray CLAY (CH) w/calcareous material
[Diagonal Hatching]	35	4.5+	24				57	24	33		
	40										Bottom @ 35'

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-186
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-7
FILE NO. 80-269
DATE 4/1/81

FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 10 FEET WASH BORED 10 TO 48 FEET			
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO AT 38 FT. DEPTH. WATER AT 23.1 FT. AFTER 24 hours
								Liquid	Plastic	Plasticity Index	
								LL	PL	PI	
DESCRIPTION OF STRATUM											
5											Stiff to very stiff tan and light gray SILTY CLAY (CL) w/calcareous nodules w/sand layers @ 9'
10			19				45	17	28		
15			19				46	17	29		
20											Very stiff to hard reddish brown & light gray CLAY (CH) w/calcareous nodules
25			19				59	23	36		
30											
35			21				62	24	38		
40											Dense reddish brown SANDY SILT (ML)

• SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-187
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-7
FILE NO. 80-269
DATE 4/1/81

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SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED		TO		FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain, %	ATTERBERG LIMITS			WASH BORED	TO	FEET	FEET	
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED	YES	NO		
											AT		FT. DEPTH,		
										WATER AT		FT. AFTER			
													DESCRIPTION OF STRATUM		
45	N=29													Dense red brown SANDY SILT (ML)	
	2.25													Very stiff red brown CLAY	
50														Bottom @ 48'	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH TONS PER SQ. FOOT

111-4B-188

LOG OF BORING

PROJECT:

15 Acre Landfill
Tanner Road

BORING NO. CB-2

FILE NO. 80-269

CLIENT:

BSI Construction Services
Houston, Texas

DATE 4/1/81

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 4 FEET		WASH BORED 4 TO 24 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO		
								Liquid	Plastic	Plasticity Index	AT 4.0 FT. DEPTH.		
											LL	PL	PI
DESCRIPTION OF STRATUM													
3.75											Very stiff to hard red brown & light gray CLAY (CH) slightly silty		
2.75	19					42	21	21					
5	4.5+												
4.5+													
10	4.5+	20				56	23	33					
15	N=23										Firm to very dense red-brown SANDY SILT (ML)		
20	N=39										Very stiff red-brown CLAY (CH) w/thin silt layers		
2.25													
25	N=17										Bottom @ 24'		

* Note: This boring located in the pit

• SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE





PENETRATION RESISTANCE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

III-4B-189

SYMBOLS AND TERMS USED ON BORING LOGS

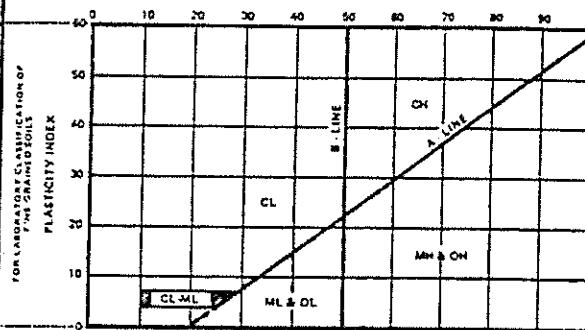
SAMPLE TYPES

-  INDICATES DEPTH OF UNDISTURBED SAMPLE
-  INDICATES DEPTH OF STANDARD PENETRATION TEST
-  INDICATES DEPTH OF DISTURBED OR AUGER SAMPLE
-  INDICATES DEPTH OF SAMPLING ATTEMPT WITH NO RECOVERY

KEY TO SAMPLES

(SHOWN IN SAMPLES COLUMN)

LIQUID LIMIT



PLASTICITY CHART

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL GRADED GRAVELLY GRAVEL SAND MIXTURES LITTLE OR NO FINES	
		POORLY GRADED GRAVELLY GRAVEL SAND MIXTURES LITTLE OR NO FINES		GP	POORLY GRADED GRAVELLY GRAVEL SAND MIXTURES LITTLE OR NO FINES	
		SILTY GRAVELS GRAVEL SAND SILT MIXTURES		GM	SILTY GRAVELS GRAVEL SAND SILT MIXTURES	
	MORE THAN 50% OF COARSE FRACTION REMAINED ON NO. 200 SIEVE	CLAYEY GRAVELS GRAVEL SAND CLAY MIXTURES		GC	CLAYEY GRAVELS GRAVEL SAND CLAY MIXTURES	
		SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL GRADED SANDS GRAVELLY SANDS LITTLE OR NO FINES
		POORLY GRADED SANDS GRAVELLY SANDS LITTLE OR NO FINES		SP	POORLY GRADED SANDS GRAVELLY SANDS LITTLE OR NO FINES	
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS ROCK FLOUR SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
		LIQUID LIMIT GREATER THAN 50		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY GRAVELLY CLAYS SANDY CLAYS SILTY CLAYS LEAN CLAYS	
		LIQUID LIMIT GREATER THAN 50		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE	LIQUID LIMIT LESS THAN 50		MH	INORGANIC SILTS MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
		LIQUID LIMIT GREATER THAN 50		CH	INORGANIC CLAYS OF HIGH PLASTICITY FAT CLAYS	
		LIQUID LIMIT GREATER THAN 50		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY ORGANIC SILTS	
HIGHLY ORGANIC SOILS			PT	PEAT HUMUS SWAMP SOILS WITH HIGH ORGANIC CONTENTS		
UNCLASSIFIED FILL MATERIALS				ARTIFICIALLY DEPOSITED EARTH AND/OR OTHER UNCLASSIFIED MATERIALS		

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

SOIL CLASSIFICATION CHART

UNIFIED SOIL CLASSIFICATION SYSTEM

RELATIVE DENSITY OF COHESIONLESS SOILS

COARSE GRAINED SOILS (major portion retained on No. 200 sieve): Includes (1) clean gravels and sands, and (2) silty or clayey gravels and sands. Conditions rated according to standard penetration test (SPT) as performed in the field.

Descriptive Term	Blows Per Foot*
Very Loose	0 - 4
Loose	5 - 10
Firm	11 - 30
Dense	31 - 50
Very Dense	over 50

*140 pound weight having a free fall of 30 inches.

CONSISTENCY OF COHESIVE SOILS

FINE GRAINED SOILS (major portion passing No. 200 sieve): Includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength as indicated by penetrometer readings or by unconfined compression tests.

Descriptive Term	Unconfined Compressive Strength Ton/Sq. Ft.
Very Soft	Less than 0.25
Soft	0.25 to 0.50
Medium	0.50 to 1.00
Stiff	1.00 to 2.00
Very Stiff	2.00 to 4.00
Hard	4.00 and higher

NOTE: Silty and fissured clays may have lower unconfined compressive strengths than shown above, because of weakness or cracks in the soil. The consistency ratings of such soils are based on penetrometer readings.

TERMS CHARACTERIZING SOIL STRUCTURE

- Slickensided** — having inclined planes of weakness that are slick and glossy in appearance.
- Fissured** — containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
- Laminated** — composed of thin layers of varying color and texture.
- Interbedded** — composed of alternate layers of different soil types.
- Calcareous** — containing appreciable quantities of calcium carbonate.
- Well graded** — having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
- Poorly graded** — predominantly of one grain size, or having a range of sizes with some intermediate size missing.

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CR-1
FILE NO. 82-002
DATE 1/20/82
Elev. 102.7

CLIENT: BSI Construction Services
Houston, Texas

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED TO FEET		WASH BORED 0 TO 50 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO		
								Liquid	Plastic	Plasticity Index	AT		
											F.T. DEPTH.		
LL	PL	PI	WATER AT		F.T. AFTER								
DESCRIPTION OF STRATUM													
[Diagonal Hatching]	1.0											Stiff gray SANDY CLAY (CL)	
	3.0		16				29	16	13			w/calcareous nodules below 2'	
	5		3.0										
	4.0											very stiff tan & light gray @ 6'	
	10		2.0										
[Diagonal Hatching]	15		4.5	21								Very stiff tan & light gray CLAY (CL) w/calcareous nodules	
	20		4.5	18			42	19	23			Very stiff tan & light gray SILTY CLAY (CL)	
[Diagonal Hatching]	25		4.5									Very stiff red & light gray CLAY (CH) w/calcareous nodules	
	30		4.5	19			47	21	26			silty @ 28'-30'	
	35		4.5										
	40		4.5										

* SLICKENSIDED FAILURE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 () CONFINING PRESSURE, PSI
 TSF - POCKET PENETROMETER OR TORVANE
 G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-191

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CB-1
FILE NO. 82-002
DATE 1/20/82

CLIENT: BSI Construction Services
Houston, Texas

Page 2 of 2

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED TO FEET		WASH BORED TO FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (ft) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED	YES	NO
								Liquid	Plastic	Plasticity Index			
DESCRIPTION OF STRATUM													
45	N=29	-200 = 70 %										Very stiff red & light gray CLAY* (CH)	
												Firm red & light gray VERY SANDY SILT (ML)	
50		2.0										Very stiff red & light gray CLAY (CH)	
												Firm red SILTY SAND (SM)	
													Bottom @ 50'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

III-4B-192

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CB-2
FILE NO. 82-002
DATE 1/21/82
Elev. 102.2

CLIENT: BSI Construction Services
Houston, Texas

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED TO FEET		WASH BORED 0 TO 60 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content w_p	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO	AT FT DEPTH.
								Liquid	Plastic	Plasticity Index		
DESCRIPTION OF STRATUM												
	1.5										Stiff gray SANDY CLAY (CL)	
	1.5										w/calcareous nodules below 2'	
	5-1.0										tan & light gray @ 6'	
	1.5	17										
	10-3.0										Very stiff tan & light gray CLAY (CH)	
											w/calcareous nodules	
	15-2.0	22									Very stiff tan & light gray SILTY CLAY (CL)	
											w/calcareous nodules & caliche	
20-4.5												
25-4.5	21						45	21	21			
30-4.5										Very stiff red & light gray CLAY (CH)		
35-4.5	24						65	27	38			
40-4.5												

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE III-4B-193
STRENGTH, TONS PER SQ FOOT

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CB-2
FILE NO. 82-002
DATE 1/21/82

CLIENT: BSI Construcion Services
Houston, Texas

Page 2 of 2

SOIL SYMBOL	FIELD DATA			LABORATORY DATA					DRY AUGERED WASH BORED	TO TO	FEET FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (tip or 1st)	Moisture Content %	Dry Density pcf	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS					
								Liquid	Plastic	Plasticity Index	FREE WATER ENCOUNTERED	YES	NO
										DESCRIPTION OF STRATUM			
	45		4.5							Very stiff red & light gray CLAY (CH)			
	50									Firm red CLAYEY SILT (ML) w/clay layers			
	55		3.0	24				30	20	10			
	60		N=15										
										Bottom @ 60'			

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANOARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-194
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ FOOT

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CB-3

FILE NO. 82-002

CLIENT: BSI Construction Services
Houston, Texas

DATE 4/5/82

Elev. 104.0

FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET				
SOIL SYMBOL	DEPTH (Feet)	SAMPLES	Penetration Resistance (q) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO	AT 31 FT. DEPTH.	WATER AT 10.6 FT. AFTER end of day
								Liquid	Plastic	Plasticity Index			
								LL	PL	PI			
DESCRIPTION OF STRATUM													
[Symbol]	2.0												Stiff dark gray SANDY CLAY (CL)
	2.5												
5	1.5												
[Symbol]	2.0		20					56	19	37			Stiff tan & gray CLAY (CH) w/calcareous material very stiff @ 13'
	2.5												
10	4.5												
[Symbol]	4.0		21					37	20	17			Very stiff tan & light gray SILTY CLAY (CL)
	4.5												
20	4.5												
[Symbol]	4.5												Very stiff red & light gray CLAY (CH) w/calcareous nodules @ 28'
	4.5		22					58	28	30			
25	3.0												
[Symbol]	N=60					-200 =30%							Dense red & light gray SILTY SAND (SM)
40													

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G. S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-195
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT Western Landfill Application
Harris County, Texas

BORING NO CB-3

FILE NO 82-002

CLIENT BSI Construction Services
Houston, Texas

DATE 4/5/82

Page 2

FIELD DATA			LABORATORY DATA					DRY AUGERED 0 TO 30 FEET		WASH BORED 30 TO 50 FEET		
SOIL SYMBOL	DEPTH (feet)	SAMPLE NO.	Penetration Resistance (blows/ft)	Moisture Content	Dry Density (pcf)	Compressive Strength (psi)	Failure Strain	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid	Plastic	Plasticity Index		
LL	PL	PI	DESCRIPTION OF STRATUM									
	45	X	N=50 8"									Dense red & light gray SILTY SAND (SM)
	50	X	N=46									Bottom @ 50'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSP - POCKET PENETROMETER OR TORVANE III-4B-196
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT Western Landfill Application
 Harris County, Texas

CLIENT: BSI Construction Services
 Houston, Texas

BORING NO. CB-4
 FILE NO. 82-002
 DATE 3/31/82
 Elev. 104.0

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 37 FEET WASH BORFD 37 TO 50 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (lb/in ²)	Moisture Content (%)	Dry Density (pcf)	Compressive Strength (tsf)	Failure Strain (%)	ATTERBERG LIMITS			
								LL	PL		PI
										FREE WATER ENCOUNTERED <u>YES</u> NO	
										AT 37 FT DEPTH	
										WATER AT 27.9 FT AFTER 15 min.	
										DESCRIPTION OF STRATUM	
	5		2.5							Stiff dark gray SANDY CLAY (CL) w/fill material @ surface	
	4.5		4.5	12				39	16	23	very stiff, tan & light gray @ 6'
	10		4.5								
	15		N=28			-200 =10%					Firm tan & light gray SLIGHTLY SILTY SAND (SM)
	20		2.0	17				37	16	21	Stiff tan & light gray SANDY CLAY (CL) w/sand pockets & calcareous material
	25		4.5								Very stiff red & light gray CLAY (CH) w/calcareous & ferrous nodules
	30		4.5	28				70	28	42	
	35		4.5								
	40		N=22								Firm light gray SLIGHTLY SILTY SAND (SM)

* SLICKSIDED FAILURE
 (C) CONFINING PRESSURE, PSI
 G S GRAIN SIZE

PENETRATION RESISTANCE
 (N) STANDARD PENETRATION RESISTANCE (SPT)
 TSF POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-197

LOG OF BORING

PROJECT Western Landfill Application
 Harris County, Texas

CLIENT: BSI Construction Services
 Houston, Texas

BORING NO CB-4
 FILE NO. 82-002
 DATE 3/31/82

Page 2

FIELD DATA			LABORATORY DATA					ATTERBERG LIMITS		
SOIL SYMBOL	DEPTH (feet)	SAMPLE NO.	Penetration Resistance (lb or 1/4)	Moisture Content	Dry Density, PCF	Compressive Strength (TSF)	Failure Strain	Liquid	Plastic	Plasticity Index
DESCRIPTION OF STRATUM										
	45	N=41			-200 =10%					
	50	N=50 3"								
Bottom @ 50'										

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G S GRAIN SIZE

PENETRATION RESISTANCE
 (N) STANDARD PENETRATION RESISTANCE (SPT)
 TSF POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE III-4B-198
 STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT Western Landfill Application
Harris County, Texas

BORING NO. CB-5

FILE NO. 82-002

CLIENT: BSI Construction Services
Houston, Texas

DATE 4/1/82

Elev. 104.1

FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 21 FEET				
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (lb or Tsf)	Moisture Content %	Dry Density, PCU	Compression Strength TSF	Failure Strain %	ATTERBERG LIMITS			WASH BORFD 21 TO 50 FEET		
								Liquid	Plastic	Plasticity Index		FREE WATER ENCOUNTERED YES <u>NO</u>	
												AT	FT DEPTH
LL	PL	PI	DESCRIPTION OF STRATUM										
[Diagonal Hatching]	3.5									Very stiff dark gray SANDY CLAY~(CL) w/fill material @ surface tan & light gray @ 4' w/sand pockets @ 6'			
	5												
	4.0												
	3.0	12					31	16	15				
[Diagonal Hatching]	10												
[Dotted]	15	X	N=24							Firm tan & light gray SAND (SP)			
[Dotted]	20	X	N=28										
[Dotted]	25	X	N=45										
[Dotted]	30	X	N=60										
[Dotted]	35	/	N=16										
[Dotted]	40	X	N=9							Firm tan SILTY SAND (SM)			

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE III-4B-199
STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Western Landfill Application
 Harris County, Texas

CLIENT: BSI Construction Services
 Houston, Texas

BORING NO. CB-5
 FILE NO. 82-002
 DATE 4/1/82
 Page 2

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 21 FEET		WASH BORED 21 TO 50 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (q) or TSF	Moisture Content (%)	Dry Density (pcf)	Compressive Strength (tsf)	Failure Strain (%)	ATTERBERG LIMITS			FREE WATER ENCOUNTERED	YES	NO
								Liquid	Plastic	Plasticity Index			
DESCRIPTION OF STRATUM													
													Firm tan SILTY SAND (SM)
	45	X	N=19			-200 =52%							Firm red VERY SANDY SILT (ML) w/clay layers
	50	X	N=15										Firm red SILTY SAND (SM)
													Bottom @ 50'

* SLICKSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-200

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CB-6
FILE NO. 82-002
DATE 4/1/82
Elev. 103.9

CLIENT: BSI Construction Services
Houston, Texas

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 21 FEET		WASH BORED 21 TO 60 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or (TSF)	Moisture Content %	Dry Density, PCF	Compressive Strength (TSF)	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES <u>NO</u>	AT _____ FT DEPTH.	
								Liquid	Plastic	Plasticity Index			WATER AT _____ FT. AFTER
DESCRIPTION OF STRATUM													
[Diagonal Hatching]	4.5	11									Very stiff dark gray VERY SANDY CLAY (CL) w/fill material @ surface		
	5	2.5											
[Diagonal Hatching]	4.5	11					31	15	16		Very stiff tan & light gray SANDY CLAY (CL) w/ferrous nodules		
	10	4.5											
[Diagonal Hatching]	15										Firm light gray CLAYEY SAND (SC)		
[Dotted Pattern]	20	N=31									Dense light gray SAND (SP) tan & light gray @ 24'		
	25	N=45											
	30	N=48											
[Diagonal Hatching]	35	3.5	25				55	24	31		Very stiff red & light gray CLAY (CH) w/silt pockets & layers		
	40	4.5	32										

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH TONS PER SQ FOOT

11-4B-201

LOG OF BORING

PROJECT. Western Landfill Application
Harris County, Texas

BORING NO. CB-6
FILE NO. 82-002
DATE 4/1/82

CLIENT. BSI Construction Services
Houston, Texas

Page 2

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 21 FEET		WASH BORED 21 TO 60 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (ft) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES <u>NO</u>		
								Liquid	Plastic	Plasticity Index	AT _____ FT. DEPTH.		
											WATER AT _____ FT. AFTER		
LL	PL	PI	DESCRIPTION OF STRATUM										
												Very stiff red & light gray CLAY (CH)	
	45	N=23				-200 =73%						Firm red CLAYEY SILT (ML) w/sand layers @ 44'	
	50	N=27										w/clay layers @ 49'	
	55	N=46										Very stiff red CLAY (CH)	
	60	N=50 5 TH										Very dense red SAND (SP)	
												Bottom @ 60'	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) STANDARD PENETRATION RESISTANCE (SPT) 4B-202
TSF POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CR-7
FILE NO. 82-002
DATE 4/2/82
Elev. 84.5

CLIENT: BSI Construction Services
Houston, Texas

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 12 FEET WASH BORED 12 TO 20 FEET	FREE WATER ENCOUNTERED <u>YES</u> NO AT 12.5 FT. DEPTH. WATER AT 0.0 FT. AFTER 10 min.
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or 1SF	Moisture Content %	Dry Density, PCF	Compressive Strength 1SF	Failure Strain %	ATTERBERG LIMITS				
								Liquid	Plastic	Plasticity Index		
DESCRIPTION OF STRATUM												
			3.5								Stiff tan & gray SLIGHTLY SILTY CLAY (CL)	
			1.5								dark gray @ 3' "FILL"	
			2.0									
			1.5	31				49	18	31		
			2.0								Stiff tan & dark gray CLAY (CH)	
			N=9								Firm tan SAND (SP)	
			N=16									
											Bottom @ 20'	

* SLICKENSIDED FAILURE
(1) CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE III-4B-203
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT Western Landfill Application
Harris County, Texas

BORING NO. CB-8

CLIENT. BSI Construction Services
Houston, Texas

FILE NO. 82-002

DATE 4/2/82

Elev. 90.8

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 19 FEET		WASH BORED 19 TO 50 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (lb) or TSF	Moisture Content %	Dry Density PCF	Compressive Strength (TSF)	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED	YES NO
								Liquid	Plastic	Plasticity Index		
DESCRIPTION OF STRATUM												
	4.5										Very stiff red & gray CLAY (CH) w/ferrous nodules @ 2-4'	
	3.5		22				53	20	33			
	5		4.5									
	4.5											
	4.5											
	10		4.5								w/claystones @ 13'	
	3.5		22				56	25	31			
	15		4.0									
	20	X	N=39								Dense red & light gray CLAYEY SILT (ML) w/sand layers	
	25	X	N=28		-200 =82%							
	30		3.0								Very stiff red VERY SILTY CLAY (CL) w/silt layers @ 33-35'	
	35		2.5	20			29	22	7			
	40	X	N=19									

* SLICKENSIDED FAILURE (N) - STANDARD PENETRATION RESISTANCE (SPT)
 (1) CONFINING PRESSURE, PSI TSF - POCKET PENETROMETER OR TORVANE
 G.S. GRAIN SIZE ESTIMATED UNCONFINED COMPRESSIVE III-4B-204
 STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CB-8

CLIENT: BSI Construction Services
Houston, Texas

FILE NO. 82-002

DATE 4/2/82

Page 2

FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 19 FEET WASH BORED 19 TO 50 FEET		
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (60 or 150)	Moisture Content %	Dry Density, PCF	Compressive Strength, TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO AT 19 FT DEPTH. WATER AT 8.6 FT AFTER 24 hours
								LL	PL	PI	
DESCRIPTION OF STRATUM											
											Very stiff red CLAY (CH)
	45		4.5								
	50		4.5								
											Bottom @ 50'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ FOOT III-4B-205

LOG OF BORING

PROJECT Western Landfill Application
 Harris County, Texas

CLIENT. BSI Construction Services
 Houston, Texas

BORING NO. CB-9
 FILE NO. 82-002
 DATE 4/5/82
 Elev. 107.1

FIELD DATA			LABORATORY DATA					DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET			
SOIL SYMBOL	DEPTH (feet)	SAMPLE(S)	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density PCF	Compressive Strength TSF	Factor Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES <u>NO</u> AT _____ FT. DEPTH. WATER AT _____ FT. AFTER
								Liquid	Plastic	Plasticity Index	
DESCRIPTION OF STRATUM											
	3.5									Very stiff tan & gray SANDY CLAY (CL) w/sand pockets & fill material @ 0-4'	
	2.0	16					32	17	15		
	5	4.0									
	4.0										
	4.5										
10	4.5										
15	2.5	13					33	17	16		
	20	N=24								Firm tan & light gray SAND (SP) dense @ 24'	
	25	N=37									
	30	N=53									
	35	N=16								Very stiff red & light gray CLAY (CH)	
	40	3.5	22				68	30	38		

* SLICKENSIDED FAILURE
 () CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE
 STRENGTH, TONS PER SQ. FOOT

III-4B-206

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-9
FILE NO. 82-002
DATE 4/5/82

Page 2

FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET			
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or (TSF)	Moisture Content (%)	Dry Density, PCF	Compressive Strength (TSF)	Failure Strain (%)	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO		
								Liquid	Plastic	Plasticity Index		AT	FT. DEPTH.
DESCRIPTION OF STRATUM													
Very stiff red & light gray CLAY (CH)													
Dense tan & gray SAND (SP)													
Bottom @ 50'													

* SLICKENSIDED FAILURE
(N) - CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-207

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CB-10
FILE NO. 82-002
DATE 4/5/82
Elev. 107.6

CLIENT: BSI Construction Services
Houston, Texas

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (bl or TSF)	Moisture Content %	Dry Density (pcf)	Compressive Strength (TSF)	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO AT _____ FT DEPTH. WATER AT _____ FT. AFTER	
								Liquid	Plastic	Plasticity Index		
												LL
DESCRIPTION OF STRATUM												
[Diagonal Hatching]	1.0										Stiff tan & gray SANDY CLAY (CL) w/sand pockets & streaks @ 13'	
	1.5											
	5											
	4.0			8				31	18	13		
	4.0											
[Dotted Pattern]	10											
	4.5											
	15			2.0	14			29	17	12		
	20	X	N=22								Firm tan & light gray SLIGHTLY SILTY SAND (SM)	
	25	X	N=24			-200 =12%						
30	X	N=55										
35	X	N=60										
40	X	N=53										

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

(NI) - PENETRATION RESISTANCE
TSF - STANDARD PENETRATION RESISTANCE (SPT)
POCKET PENETROMETER OR TORVANE III-4B-208
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CB-10
FILE NO. 82-002
DATE 4/5/82

CLIENT: BSI Construction Services
Houston, Texas

Page 2

FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET		
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content % _w	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES <u>NO</u>	
								Liquid	Plastic	Plasticity Index		AT
								LL	PL	PI	WATER AT	FT. AFTER
DESCRIPTION OF STRATUM												
											Dense tan & light gray SAND (SP)	
	45	X	N=32									
	50	X	N=50									
											Bottom @ 50'	

* SLICKENSIDED FAILURE
(1) CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) STANDARD PENETRATION RESISTANCE (SPT)
TSF POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE III-4B-209
STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: Western Landfill Application
 Harris County, Texas

CLIENT: BSI Construction Services
 Houston, Texas

BORING NO. CB-11
 FILE NO. 82-002
 DATE 4/2/82
 Elev. 97.0

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 19 FEET WASH BORED 19 TO 58 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (q) in 15'	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			
								LL	PL		PI
										FREE WATER ENCOUNTERED <u>YES</u> NO	
										AT 19 FT. DEPTH.	
										WATER AT * FT. AFTER *hole caved in at 15.4 ft.	
										DESCRIPTION OF STRATUM	
			4.5							Very stiff tan & gray SANDY CLAY (CL)	
			2.0							Firm light gray SAND (SP)	
	5	X	N=18								
		X	N=14								
	10	X	N=19								
		X	N=19								
	15	X	N=19								
		X	N=24								
	20	X	N=24								
		X	N=20								
	25	X	N=20								
		X	N=46							dense @ 29'	
	30	X	N=46								
		X	N=33								
	35	X	N=33								
		X	N=22								
	40	X	N=22								

* SLICKENSIDED FAILURE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 (C) - CONFINING PRESSURE, PSI
 G.S. - GRAIN SIZE

TSF - ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ FOOT
 III-4B-210

LOG OF BORING

PROJECT: Western Landfill Application
Harris County, Texas

BORING NO. CB-11

FILE NO. 82-002

DATE 4/2/82

CLIENT: BSI Construction Services
Houston, Texas

Page 2

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 19 FEET WASH BORED 19 TO 58 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (R) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			
								Liquid	Plastic		Plasticity Index
										FREE WATER ENCOUNTERED <u>YES</u> NO	
										AT 19 FT. DEPTH.	
										WATER AT * FT. AFTER * hole caved in at 15.4 ft.	
										DESCRIPTION OF STRATUM	
										Dense light gray SAND (SP)	
	45	X	N=30			-200 =51%				Dense red & light gray VERY SANDY SILT (ML) w/clay layers	
	50		4.5	24			69	32	37	Very stiff red & light gray CLAY (CH)	
	55		4.5								
	60									Bottom @ 58'	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT III-4B-211

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-1*
FILE NO. 80-269
DATE 1/5/81
Elev. 103.5

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 30 FEET		WASH BORED 30 TO 50 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO		
								Liquid	Plastic	Plasticity Index			
								LL	PL	PI	AT 26.0 FT. DEPTH. WATER AT _____ FT. AFTER		
DESCRIPTION OF STRATUM													
4.5+													Hard dark gray SANDY CLAY (CL) very stiff 2-4' calcareous nodules @ 4' stiff 6-8' very stiff, tan & gray @ 8'
4.5													
2.5													
5	1.75	18					32	15	17				
2.5													
10	3.5												Very stiff red & light gray CLAY (CH) w/calcareous nodules
15	3.75												
20	4.5						44	19	25				
25	4.5+												Hard red & light gray CLAY (CH) w/calcareous nodules
30	4.5+	18	116	4.78	5								
35	4.5+												
40													Very dense red very SILTY FINE SAND (SM)

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

ATTERBERG LIMITS
PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-1*
FILE NO. 80-269
DATE 1/5/81

Page -2-

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO AT 26.0 FT. DEPTH. WATER AT _____ FT. AFTER _____	
								Liquid	Plastic	Plasticity Index		
	LL	PL	PI	DESCRIPTION OF STRATUM								
45	X	N=50 6"			G.S.							Very dense red very SILTY FINE SAND (SM)
50	X											Bottom @ 50'

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

4B-213

LOG OF BORING

PROJECT:

15 Acre Landfill
Tanner Road

BORING NO. CB-2*

FILE NO. 80-269

CLIENT:

BSI Construction Services
Houston, Texas

DATE 1/9/81

Elev. 101.8

FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 30 FEET		WASH BORED 30 TO 60 FEET			
SOIL SYMBOL	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTEBERG LIMITS			FREE WATER ENCOUNTERED YES <u>NO</u>		
								Liquid	Plastic	Plasticity Index		AT	FT. DEPTH.
DESCRIPTION OF STRATUM													
4.5+											Hard dark gray SANDY CLAY (CL) * tan & gray w/sand pockets @ 2'		
4.0	12						36	17	19				
4.5+													
4.5+													
4.5+													
4.5+													
4.5+	17										Hard red & light gray CLAY (CH) w/calcareous nodules		
4.5+													
4.5+													
4.5+													
4.5+													
4.5+	22						51	24	27		Dense red very SILTY FINE SAND (SM-ML)		
4.5+													

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE III-4B-214
STRENGTH, TONS PER SQ FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-2*
FILE NO. 80-269
DATE 1/9/81

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 30 FEET		WASH BORED 30 TO 60 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES <u>NO</u>		
								Liquid	Plastic	Plasticity Index	AT FT. DEPTH.		
											WATER AT FT. AFTER		
LL	PL	PI	DESCRIPTION OF STRATUM										
	45	X	N=49									Dense red very SILTY FINE SAND (SM-ML)	
	50	X	N=64		-200=66%							Dense red SANDY SILT (ML)	
	55	X	N=43		-200=22%							Dense red SILTY FINE SAND (SM)	
	60		4.5									Very stiff red CLAY (CH)	
												Bottom @ 60'	

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CS-3[#]
FILE NO. 80-269
DATE 1/5/61

Elev. 102.4

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET			
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO	
								Liquid	Plastic	Plasticity Index		AT 28.0 FT. DEPTH.
DESCRIPTION OF STRATUM												
4.5+										Hard dark gray very SANDY CLAY "FILL"		
4.5+										Hard gray SANDY CLAY (CL) w/calcareous nodules very stiff, tan & gray @ 4'		
5		3.0										
3.25												
3.75												
10												
4.5			21							Hard red & light gray CLAY (CH)		
15												
4.5+			15							Hard tan & red SANDY CLAY (CL)		
20												
4.5+										Hard red & light gray CLAY (CH)		
25												
4.5+										Hard red & light gray SILTY CLAY (CL)		
30												
4.5+										Hard red & light gray CLAY (CH)		
35												
4.5+			22	106	1.42*	2	60	26	34			
40												

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

ATTERBERG LIMITS
PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH TONS PER SQ. FOOT

LOG OF BORING

PROJECT: 15 Acre Landfill
 Tanner Road
 CLIENT: BSI Construction Services
 Houston, Texas

BORING NO. CB-3*
 FILE NO. 80-269
 DATE 1/5/81
 Page -2-

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRY AUGERED 0 TO 30 FEET WASH BORED 30 TO 50 FEET
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or FSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain, %	ATTERBERG LIMITS			
								Liquid	Plastic	Plasticity Index	
											FREE WATER ENCOUNTERED <u>YES</u> NO
											AT 28.0 FT. DEPTH.
											WATER AT _____ FT. AFTER
											DESCRIPTION OF STRATUM
											Hard red & light gray CLAY (CH)
											Very dense red very SILTY FINE SAND (SM)
	45	X	N=50 6"								firm @ 48'
	50	X	N=26								Bottom @ 50'

* SLICKSIDED FAILURE
 (1) CONFINING PRESSURE, PSI
 G.S. GRAIN SIZE

• PENETRATION RESISTANCE
 (N) - STANDARD PENETRATION RESISTANCE (SPT)
 TSF - POCKET PENETROMETER OR TORVANE
 ESTIMATED UNCONFINED COMPRESSIVE STRENGTH

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-4*
FILE NO. 80-269
DATE 1/9/81
Elev. 103.0

SOIL SYMBOL	FIELD DATA		LABORATORY DATA						DRY AUGERED 0 TO 42 FEET WASH BORED TO FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO AT 42.0 FT. DEPTH. WATER AT _____ FT. AFTER
								LL	PL	PI	
DESCRIPTION OF STRATUM											
4.5+										Hard dark gray very SANDY CLAY "FILL"	
4.5+										Hard tan & gray SANDY CLAY (CL) w/calcareous nodules very stiff below 6'	
5											
2.0											
1.5											
2.75											
10										Very stiff red & tan CLAY (CH)	
4.0											
15											
4.5+		15					41	16	25	Hard tan & gray SANDY CLAY (CL) w/calcareous nodules	
20											
4.5+										Hard red & gray CLAY (CH) w/calcareous nodules	
25											
4.5+											
30											
4.5+		18					48	23	25		
35											
4.5+											
40											

* SLICKSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE

(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

III-4B-218

LOG OF BORING

PROJECT:

15 Acre Landfill
Tanner Road

BORING NO. CB-4*

CLIENT:

BSI Construction Services
Houston, Texas

FILE NO. 80-269

DATE 1/9/81

Page -2-

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 42 FEET WASH BORED TO FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain - %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED <u>YES</u> NO
								Liquid	Plastic	Plasticity Index	
								LL	PL	PI	
DESCRIPTION OF STRATUM											
											Hard red & gray CLAY (CH)
	45										Bottom @ 42'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE
STRENGTH, TONS PER SQ. FOOT

III-4B-219

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-7*
FILE NO. 80-269
DATE 4/1/81

Elev. 101.5

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED 0 TO 10 FEET WASH BORED 10 TO 48 FEET	
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			
								Liquid	Plastic	Plasticity Index	
								LL	PL	PI	
DESCRIPTION OF STRATUM											
										Stiff to very stiff tan and light gray SILTY CLAY (CL) w/calcareous nodules	
	5										
	10		19				45	17	28	w/sand layers @ 9'	
	15		19				46	17	29		
	20									Very stiff to hard reddish brown & light gray CLAY (CH)	
	25		19				59	23	36	w/calcareous nodules	
	30										
	35		21				62	24	38		
	40									Dense reddish brown SANDY SILT (ML)	

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE STRENGTH, TONS PER SQ. FOOT

III-4B-220

LOG OF BORING

PROJECT: 15 Acre Landfill
Tanner Road

CLIENT: BSI Construction Services
Houston, Texas

BORING NO. CB-7*
FILE NO. 80-269
DATE 4/1/81

SOIL SYMBOL	FIELD DATA			LABORATORY DATA						DRY AUGERED TO FEET WASH BORED TO FEET		
	DEPTH (feet)	SAMPLES	Penetration Resistance (N) or TSF	Moisture Content %	Dry Density, PCF	Compressive Strength TSF	Failure Strain %	ATTERBERG LIMITS			FREE WATER ENCOUNTERED YES NO	
								Liquid	Plastic	Plasticity Index		
												LL
DESCRIPTION OF STRATUM												
			N=29									Dense red brown SANDY SILT (ML)
	45	X		2.25								Very stiff red brown CLAY
	50											Bottom @ 48'

* SLICKENSIDED FAILURE
() CONFINING PRESSURE, PSI
G.S. GRAIN SIZE

PENETRATION RESISTANCE
(N) - STANDARD PENETRATION RESISTANCE (SPT)
TSF - POCKET PENETROMETER OR TORVANE
ESTIMATED UNCONFINED COMPRESSIVE III-4B-221
STRENGTH, TONS PER SQ FOOT

SYMBOLS AND TERMS USED ON BORING LOGS

MAJOR DIVISIONS		GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE TO NO SAND)	GW	WELL GRAINED GRAVELS (LITTLE TO NO SAND)	
			GP	POORLY GRAINED GRAVELS (SANDY GRAVELS)	
		MORE THAN 10% OF COARSE FRACTION RETAINED ON NO. 200 SIEVE	GM	SILTY GRAVELS (GRAVELS AND SILTY SANDS)	
	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE TO NO SILT)	SW	WELL GRAINED SANDS (LITTLE TO NO SILT)	
			SP	POORLY GRAINED SANDS (SANDY SILTS)	
		MORE THAN 10% OF COARSE FRACTION RETAINED ON NO. 200 SIEVE	SM	SILTY SANDS (SANDS WITH SILT)	
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 25	ML	INORGANIC SILTS AND CLAYS (LOW PLASTICITY)	
			CL	INORGANIC CLAYS (LOW PLASTICITY)	
		LIQUID LIMIT GREATER THAN 25	OL	ORGANIC SILTS AND CLAYS (LOW PLASTICITY)	
			MH	INORGANIC SILTS (HIGH PLASTICITY)	
			CH	INORGANIC CLAYS (HIGH PLASTICITY)	
	HIGHLY ORGANIC SOILS	LIQUID LIMIT GREATER THAN 25	OH	ORGANIC CLAYS (HIGH PLASTICITY)	
			PT	PEAT (HIGH ORGANIC CONTENT)	
UNCLASSIFIED MATERIALS				ARTIFICIALLY DEPOSITED EARTH AND OTHER UNCLASSIFIED MATERIALS	

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOIL CLASSIFICATION CHART

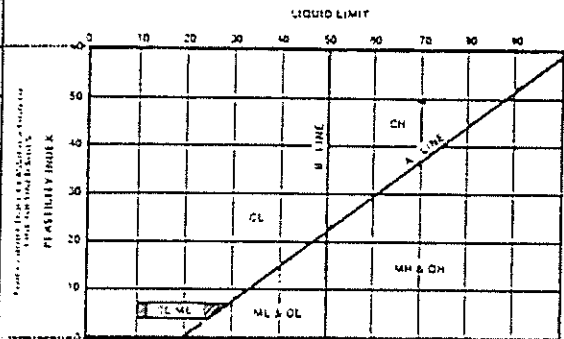
UNIFIED SOIL CLASSIFICATION SYSTEM

SAMPLE TYPES

- INDICATES DEPTH OF UNDISTURBED SAMPLE
- INDICATES DEPTH OF STANDARD PENETRATION TEST
- INDICATES DEPTH OF DISTURBED OR AUGER SAMPLE
- INDICATES DEPTH OF SAMPLING ATTEMPT WITH NO RECOVERY

KEY TO SAMPLES

(SHOWN IN SAMPLES COLUMN)



PLASTICITY CHART

RELATIVE DENSITY OF COHESIONLESS SOILS

COARSE GRAINED SOILS (major portion retained on No. 200 sieve): Includes (1) clean gravels and sands, and (2) silty or clayey gravels and sands. Conditions rated according to standard penetration test (SPT) as performed in the field.

Descriptive Term	Blows Per Foot*
Very Loose	0 - 4
Loose	5 - 10
Firm	11 - 30
Dense	31 - 50
Very Dense	over 50

*140 pound weight having a free fall of 30 inches.

CONSISTENCY OF COHESIVE SOILS

FINE GRAINED SOILS (major portion passing No. 200 sieve): Includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength as indicated by penetrometer readings or by unconfined compression tests.

Descriptive Term	Unconfined Compressive Strength Ton/Sq. Ft.
Very Soft	Less than 0.25
Soft	0.25 to 0.50
Medium	0.50 to 1.00
Stiff	1.00 to 2.00
Very Stiff	2.00 to 4.00
Hard	4.00 and higher

NOTE: Slickensided and fissured clays may have lower unconfined compressive strengths than shown above, because of weakness or cracks in the soil. The consistency ratings of such soils are based on penetrometer readings.

TERMS CHARACTERIZING SOIL STRUCTURE

- Slickensided** — having inclined planes of weakness that are slick and glossy in appearance.
- Fissured** — containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
- Laminated** — composed of thin layers of varying color and texture.
- Interbedded** — composed of alternate layers of different soil types.
- Calcareous** — containing appreciable quantities of calcium carbonate.
- Well graded** — having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
- Poorly graded** — predominantly of one grain size, or having a range of sizes with some intermediate size missing.

SOUTHWESTERN LABORATORIES
1977

LOG OF BORING D-1

PROJECT Brush Demolition Landfill, Type 4, Tanner Street, Harris County, Texas
 Project No. 77-178
 DATE 5-10-77 TYPE Soil Test Boring LOCATION See Boring Plan

DEPTH, FEET	STROKES	SAMPLES	BLOW PER FT	<input type="checkbox"/> WATER <input type="checkbox"/> SAMPLE <input checked="" type="checkbox"/> STANDARD PENETRATION
				DESCRIPTION
0				SURFACE ELEVATION 101.5'
5				Fill: sand and gravel
5				Fill: gray sandy clay with shells
10				Stiff light gray and tan very sandy clay to clayey sand
15				
20				Tan silty sand
25				
30				
35				
40				
45				
50				

*Taken from topographic plans provided to us by S & B Engineers.

LOG OF BORING B-1

PROJECT Brush Demolition Landfill, Type 4, Tanner Street, Harris County, Texas
Project No. 77-178
DATE 5-10-77 TYPE Soil Test Boring LOCATION See Boring Plan

DEPTH, FEET	SYMBOL	SAMPLES BLOWS PER FT	▼ WATER	■ SAMPLE	▤ STANDARD PENETRATION
			DESCRIPTION		
50					
SURFACE ELEVATION 103.5					
Tan silty sand					
55					
Very stiff red-brown clay					
60					
Boring Terminated at 60 feet					

A-5

SOUTHWESTERN LABORATORIES

LOG OF BORING B-2

PROJECT Brush Demolition Landfill, Type 4, Tanner Street, Harris County, Texas
 Project No. 77-178
 DATE 5-9-77 TYPE Soil Test Poring LOCATION See Boring Plan

DEPTH, FEET	SYMBOL	SAMPLES COLLECTED PER FT	▼ WATER	■ SAMPLE	⊞ STANDARD PENETRATION
			DESCRIPTION		
0					SURFACE ELEVATION 102.7
5					Stiff light gray and tan sandy clay
10					- becomes clayey sand at 13 feet
15					Tan silty sand
20					
25					
30					
35					
40					
45					
50					

A-6

SOUTHWESTERN LABORATORIES

LOG OF BORING B-2

PROJECT Brush Demolition Landfill, Type 4, Tanner Street, Harris County, Texas
 Project No. 77-178
 DATE 5-9-77 TYPE Soil Test Boring LOCATION See Boring Plan

DEPTH, FEET	STANDARD PENETRATION	SAMPLE	WATER	DESCRIPTION
				DESCRIPTION
50				SURFACE ELEVATION 102.7
55				Tan silty sand
60				Stiff red-brown sandy clay
				Boring terminated at 60 feet

LOG OF BORING B-3

PROJECT Brush Demolition Landfill, Type 4, Tanner Street, Harris County, Texas
 Project No. 77-178
 DATE 5-9-77 TYPE Soil Test Boring LOCATION See Boring Plan

DEPTH, FEET	STROKES	SAMPLES	BL. ORS PER FT.	▼ WATER	■ SAMPLE	⌘ STANDARD PENETRATION
				DESCRIPTION		
0						SURFACE ELEVATION 102.5
5						Plastic gray very sandy clay
10						- color change to light gray and tan at 8 feet
15						Light gray silty sand
20						
25						
30						
35						
40						
45						
50						

A-8

SOUTHWESTERN LABORATORIES

LOG OF BORING B-3

PROJECT Brush Demolition Landfill, Type 4, Tanner Street, Harris County, Texas
Project No. 77-178
DATE 5-9-77 TYPE Soil Test Boring LOCATION See Boring Plan

DEPTH, FEET	EVIDENCE	SAMPLES GAINED PER FT	▼ WATER	■ SAMPLE	▮ STANDARD PENETRATION
			DESCRIPTION		
50	[Hatched area]				SURFACE ELEVATION 102.5 Light gray silty sand
55					Stiff red-brown clay
60					Boring Terminated at 60 feet

A-9

SOUTHWESTERN LABORATORIES

LOG OF BORING B-4

PROJECT Brush Demolition Landfill, Type 4, Tanner Street, Harris County, Texas
Project No. 77-178

DATE 5-10-77

TYPE Soil Test Boring

LOCATION See Boring Plan

DEPTH, FEET	SYMBOL	SAMPLES COLLECTED PER FT	▼ WATER	■ SAMPLE	□ STANDARD PENETRATION	
			DESCRIPTION			
0						SURFACE ELEVATION 103.1
5						Stiff gray and tan sandy clay with sand seams
10						
15						
20						Tan silty sand
25						
30						
35						
40						
45						
50						

A-10

SOUTHWESTERN LABORATORIES

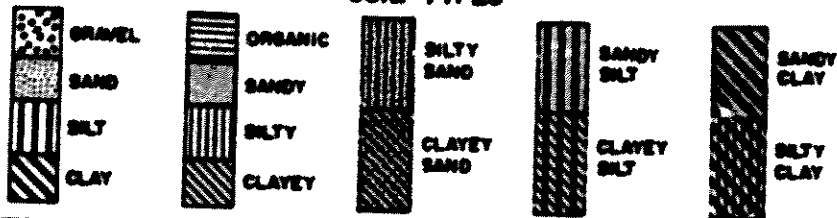
LOG OF BORING D-4

Project: Brush Demolition Landfill, Type 4, Tanner Street, Harris County, Texas
 Project No. 77-178
 DATE: 5-10-77 Type: Soil Test Boring Location: See Boring Plan

DEPTH (FEET)	DIAMETER (INCHES)	SAMPLE NO.	SPT BLOW COUNT	▼	■	□
				WATER	SAMPLE	STANDARD PENETRATION
DESCRIPTION						
50						SURFACE ELEVATION 103.1
55						Tan silty sand - with clay lenses and silt stones
60						Stiff red-brown clay
						Boring Terminated at 60 feet

KEY TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES



CONSISTENCY OF COHESIVE SOILS

DESCRIPTIVE TERM	UNCONFINED COMPRESSIVE STRENGTH, TON/90 SQ. FEET
Very Soft	Less than 0.25
Soft	0.25-0.50
Plastic	0.50-100
Stiff	100-200
Very Stiff	200-400
Hard	More than 400

RELATIVE DENSITY OF COHESIONLESS SOILS

DESCRIPTIVE TERM	STD. PENETRATION RESISTANCE, BLOW/FEET
Loose	0-10
Firm	10-30
Dense	30-60
Very Dense	More than 60

SOIL STRUCTURE

- CALCAREOUS** - Containing deposits of calcium carbonate; generally nodular.
- SLICKENSIDED** - Having inclined planes of weakness that are slick and glossy in appearance.
- LAMINATED** - Composed of thin layers of varying color and texture.
- FISHERED** - Containing shrinkage cracks frequently filled with fine sand or silt. Usually more or less vertical.
- INTERBEDDED** - Composed of alternate layers of different soil types.

TEST DATA AND SAMPLER SYMBOLS

30% FINER - Percent finer than no. 200 sieve.



- Static water level
- Hydraulic water level.



UNDISTURBED
SAMPLE



DISTURBED
SAMPLE



NO
RECOVERY

SOUTHWESTERN LABORATORIES

PIEZOMETERS

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-17

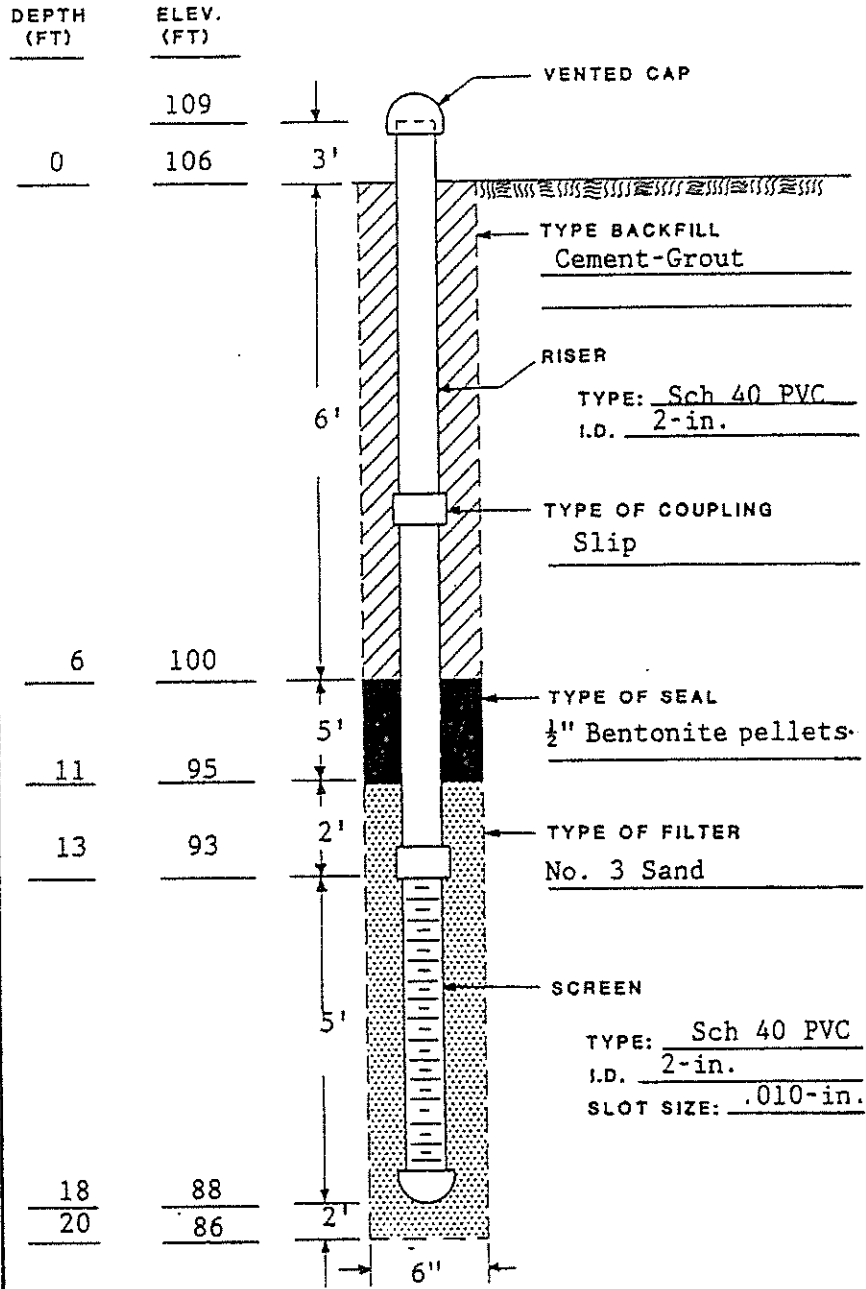
WELL NO: P-1
 PROJECT NO: 87-028

PIEZOMETER COMPLETION
 DATE: 2-28-86
 DRY AUGURED 0 TO 4 FT
 WASH BORED 4 TO 20 FT
 DRILLING FLUID Water

PIEZOMETER DEVELOPMENT
 DATE: 5-2-86
 METHOD: Compressed Air

WATER LEVEL READINGS
 FREE WATER AT FT

DATE	DEPTH	ELEVATION



REMARKS: Screened in Layer II

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill

WELL NO: P-1P

CLIENT: West Belt Development, Inc.

PROJECT NO: 87-028

LOCATION: CB-8

PIEZOMETER COMPLETION

DATE: 4-24-86
 DRY AUGURED _____ TO _____ FT
 WASH BORED 0 TO 89 FT
 DRILLING FLUID Water

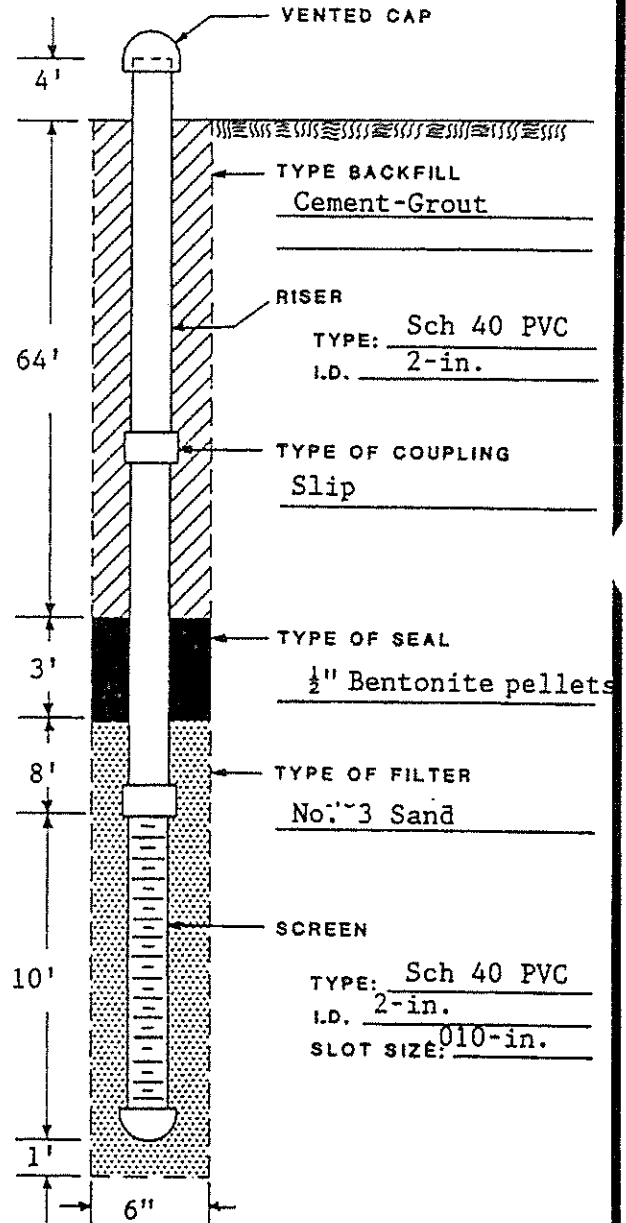
PIEZOMETER DEVELOPMENT

DATE: 7-10-86
 METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT _____ FT
 DATE DEPTH ELEVATION

DEPTH (FT)	ELEV. (FT)
0	107
64	39
67	36
75	28
85	18
86	17



REMARKS: Screened in Layer III

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-8

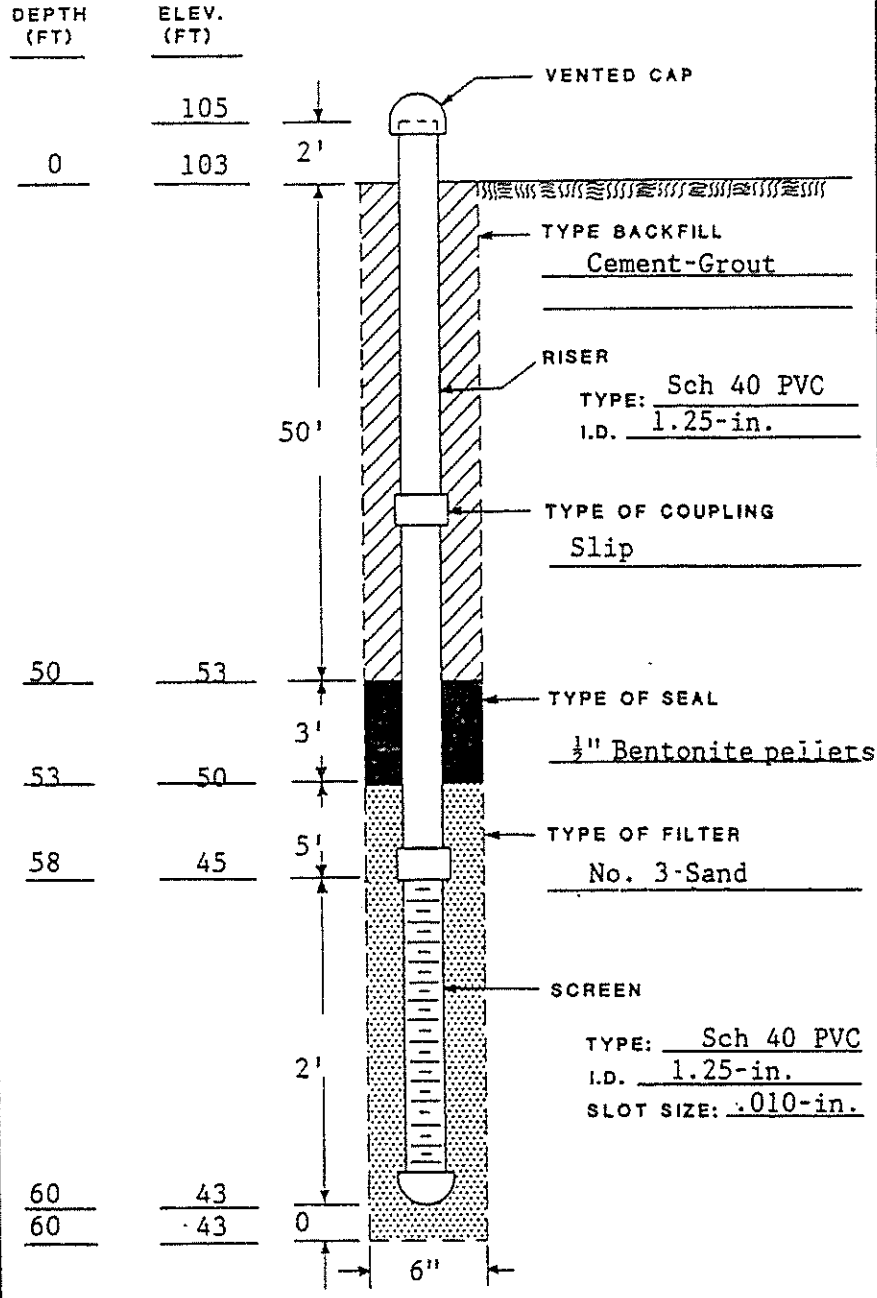
WELL NO: P-1PC
 PROJECT NO: 87-028

PIEZOMETER COMPLETION
 DATE: 7-1-86
 DRY AUGURED _____ TO _____ FT
 WASH BORED 0 TO 60 FT
 DRILLING FLUID Water

PIEZOMETER DEVELOPMENT
 DATE: 7-10-86
 METHOD: Compressed Air

WATER LEVEL READINGS
 FREE WATER AT _____ FT

DATE	DEPTH	ELEVATION
	50	53
	53	50
	58	45
	60	43
	60	43



REMARKS: Screened in Layer II

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-8

WELL NO: P-1PD
 PROJECT NO: 87-028

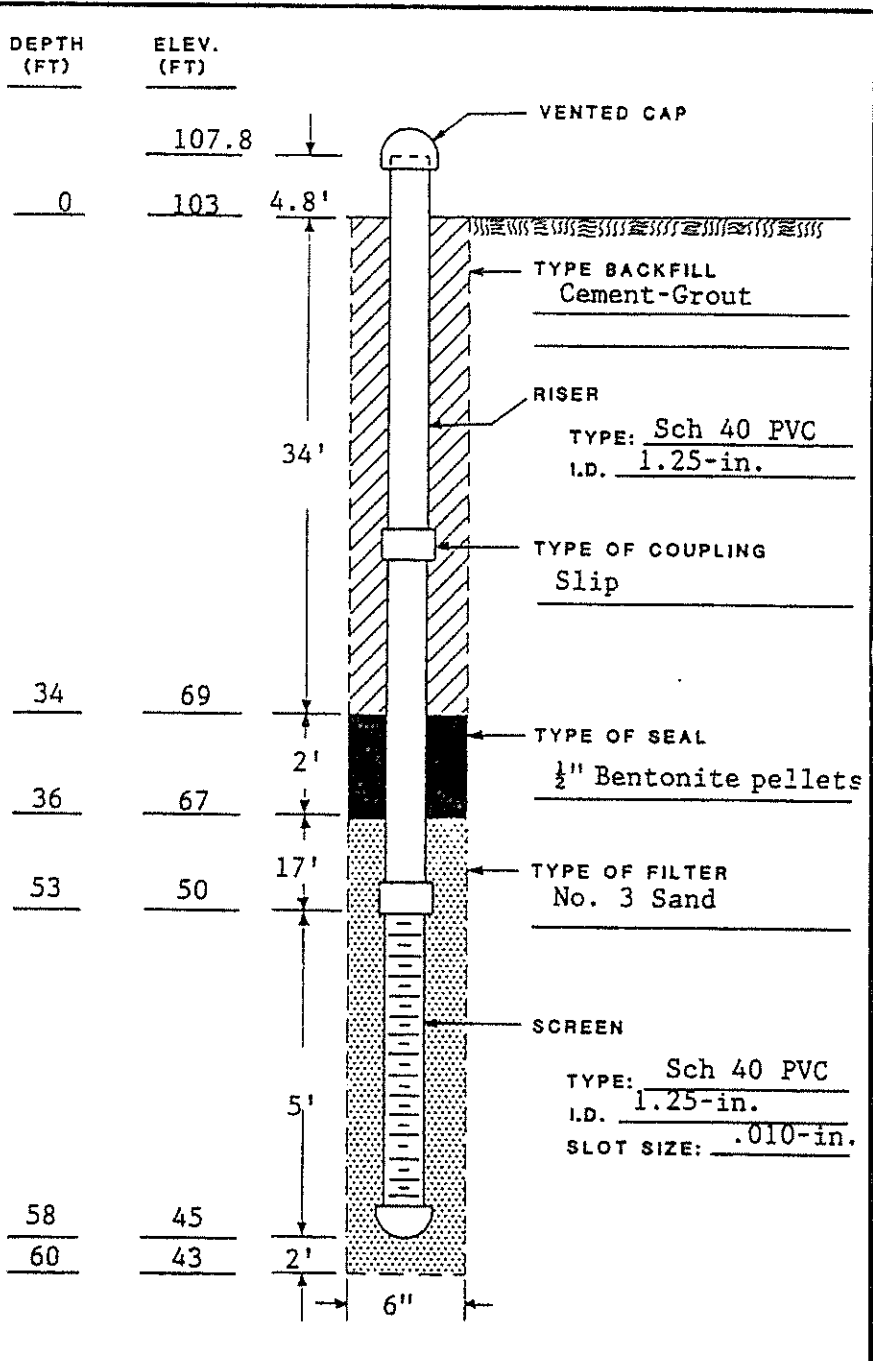
PIEZOMETER COMPLETION
 DATE: 3-10-87
 DRY AUGURED _____ TO _____ FT
 WASH BORED 0 TO 60 FT
 DRILLING FLUID Water

PIEZOMETER DEVELOPMENT
 DATE: 3-25-87
 METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT _____ FT

DATE	DEPTH	ELEVATION
	34	69
	36	67
	53	50
	58	45
	60	43



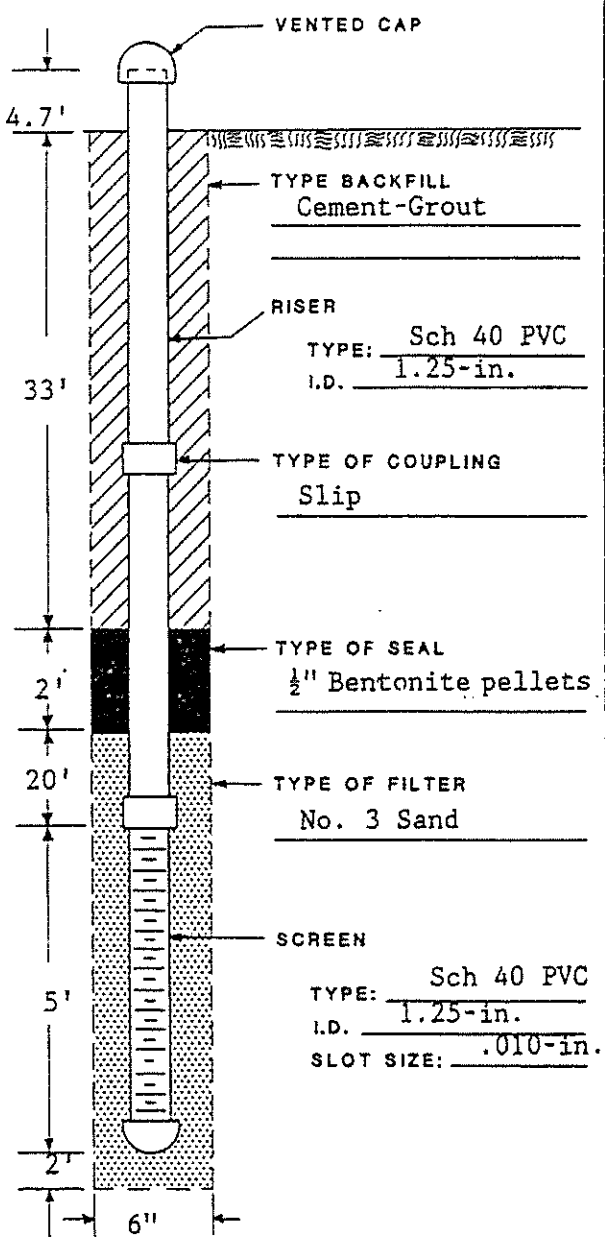
REMARKS: Screened in Layer II

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-8

WELL NO: P-1PE
 PROJECT NO: 87-028

	DEPTH (FT)	ELEV. (FT)	
PIEZOMETER COMPLETION			
DATE: <u>3-10-87</u>			107.7
DRY AUGURED _____ TO _____ FT			4.7'
WASH BORED <u>0</u> TO <u>62</u> FT	0	103	
DRILLING FLUID <u>Water</u>			
PIEZOMETER DEVELOPMENT			
DATE: <u>3-25-87</u>			33'
METHOD: <u>Compressed Air</u>			
WATER LEVEL READINGS			
FREE WATER AT _____ FT	33	70	
<u>DATE</u> <u>DEPTH</u> <u>ELEVATION</u>			
	35	68	2'
	55	48	20'
	60	43	5'
	62	41	2'
			6"



REMARKS: Screened in Layer II

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-8

WELL NO: W-1
 PROJECT NO: 87-028

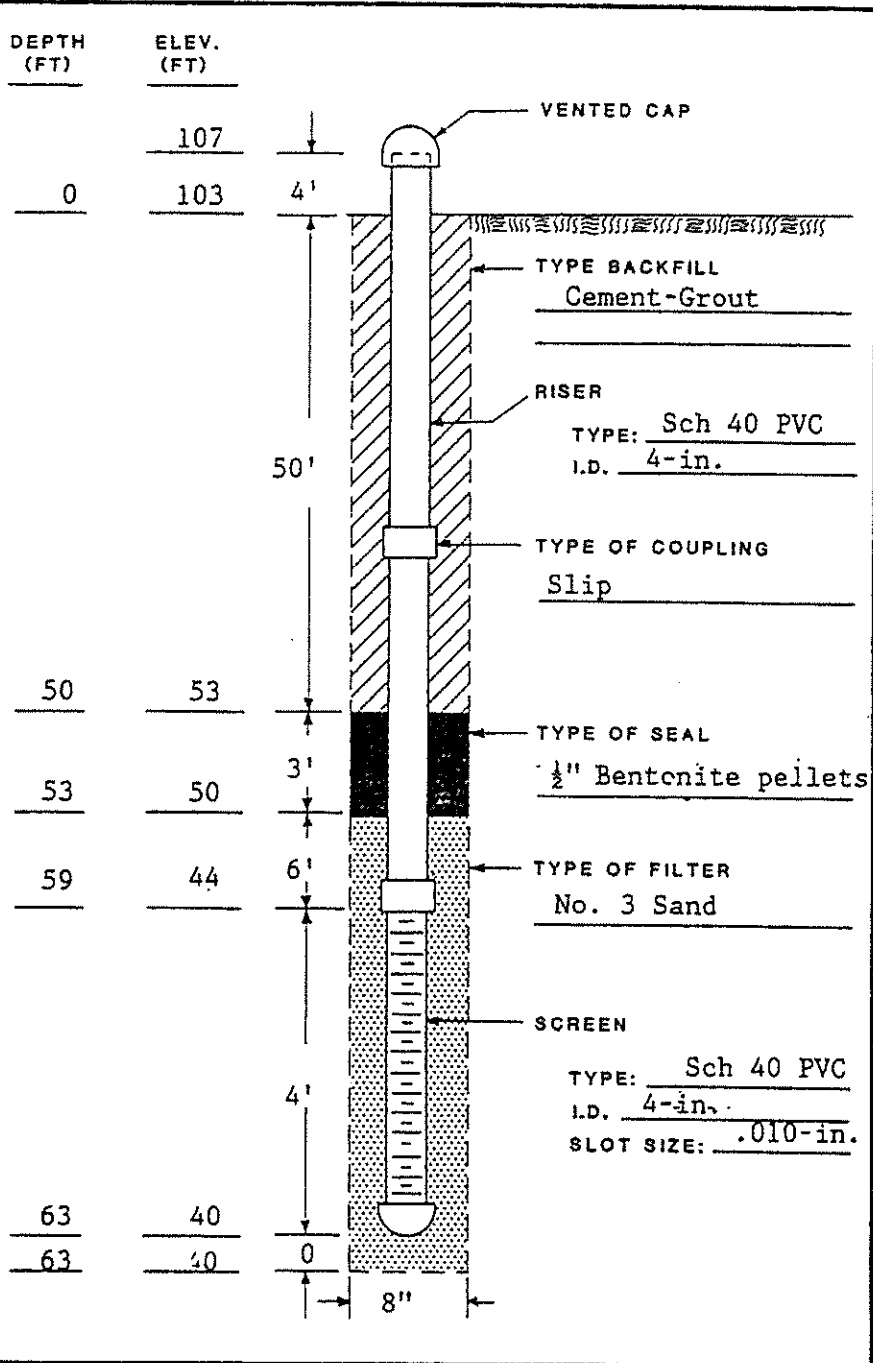
PIEZOMETER COMPLETION
 DATE: 7-1-86
 DRY AUGURED _____ TO _____ FT
 WASH BORED 0 TO 63 FT
 DRILLING FLUID Water

PIEZOMETER DEVELOPMENT
 DATE: 7-10-86
 METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT _____ FT

DATE	DEPTH	ELEVATION
	50	53
	53	50
	59	44
	63	40
	63	40



REMARKS: Screened in Layer II

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-4

WELL NO: P-2
 PROJECT NO: 87-028

PIEZOMETER COMPLETION

DATE: 3-3-86
 DRY AUGURED 0 TO 4 FT
 WASH BORED 4 TO 60 FT
 DRILLING FLUID Water

PIEZOMETER DEVELOPMENT

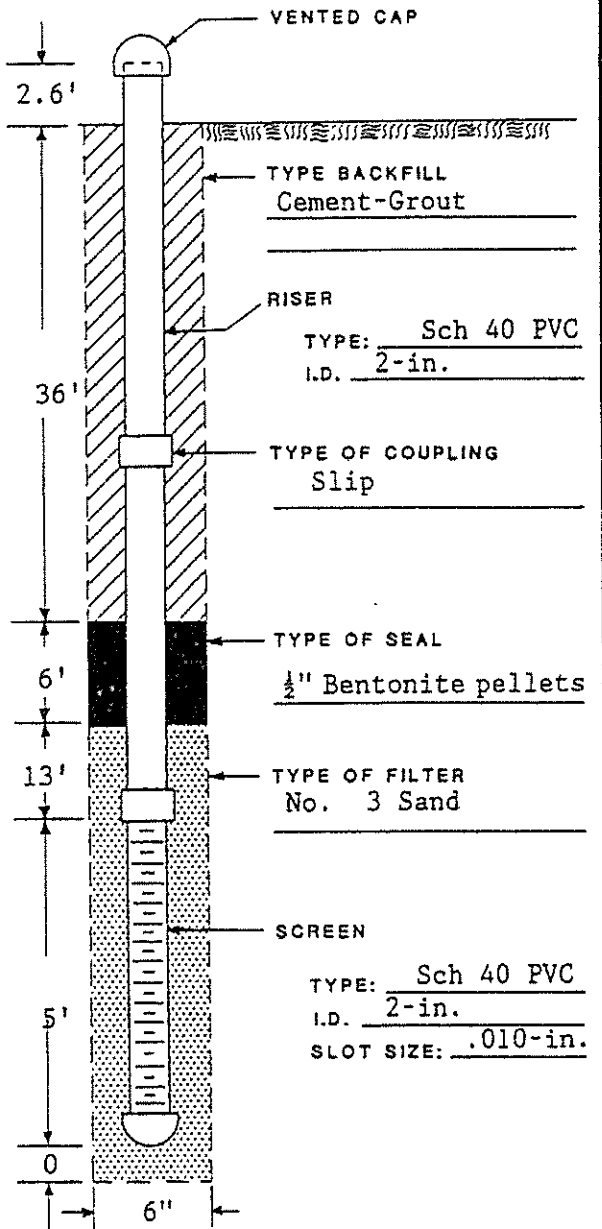
DATE: 5-2-86
 METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT --- FT

DATE	DEPTH	ELEVATION
	36	66
	42	60
	55	47
	60	42
	60	42

DEPTH (FT)	ELEV. (FT)
	104.6
0	102



REMARKS: Screened in Layer II

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-17

WELL NO: P-3
 PROJECT NO: 87-028

PIEZOMETER COMPLETION	DEPTH (FT)	ELEV. (FT)	
DATE: <u>2-28-86</u>			
DRY AUGURED <u>0</u> TO <u>21</u> FT		<u>110</u>	
WASH BORED <u>21</u> TO <u>64</u> FT	<u>0</u>	<u>106</u>	4'
DRILLING FLUID <u>Water</u>			
PIEZOMETER DEVELOPMENT			
DATE: <u>5-2-86</u>			
METHOD: <u>Compressed Air</u>			
WATER LEVEL READINGS			
FREE WATER AT <u> </u> FT			
<u>DATE</u>	<u>DEPTH</u>	<u>ELEVATION</u>	
	<u>32</u>	<u>74</u>	5'
	<u>37</u>	<u>69</u>	21'
	<u>58</u>	<u>48</u>	4'
	<u>62</u>	<u>44</u>	
	<u>64</u>	<u>42</u>	0

VENTED CAP

TYPE BACKFILL
Cement-Grout

RISER
TYPE: Sch 40 PVC
I.D. 2-in.

TYPE OF COUPLING
Slip

TYPE OF SEAL
1/2" Bentonite pellets

TYPE OF FILTER
No. 3 Sand

SCREEN
TYPE: Sch 40 PVC
I.D. 2-in.
SLOT SIZE: .010-in.

REMARKS: Screened in Layer II

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-11

WELL NO: P-3PB
 PROJECT NO: 87-028

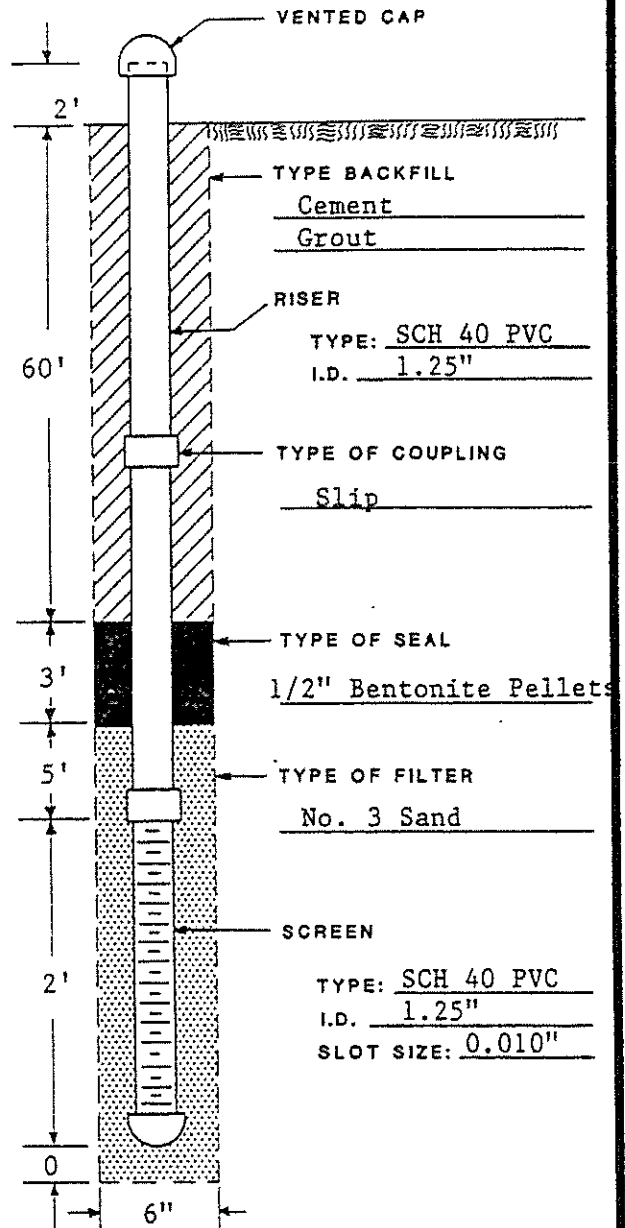
PIEZOMETER COMPLETION
 DATE: 6-27-86
 DRY AUGURED _____ TO _____ FT
 WASH BORED 0 TO 70 FT
 DRILLING FLUID Water

PIEZOMETER DEVELOPMENT
 DATE: 7-10-86
 METHOD: Compressed Air

WATER LEVEL READINGS
 FREE WATER AT _____ FT

DATE	DEPTH	ELEVATION

DEPTH (FT)	ELEV. (FT)
	106
0	104
60	44
63	41
68	36
70	34
70	34



REMARKS: Screened in Layer III

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-7

WELL NO: P-4
 PROJECT NO: 87-028

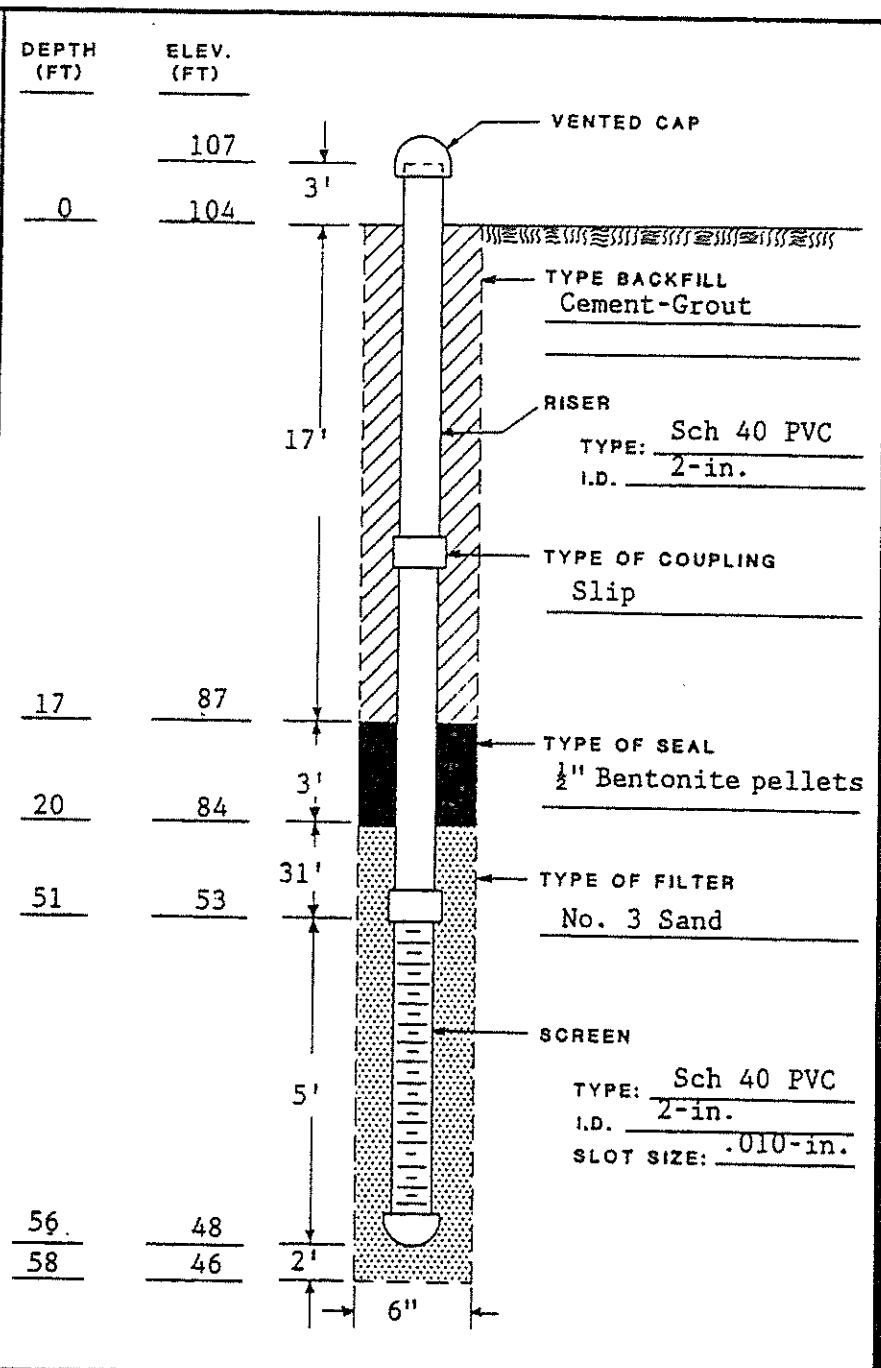
PIEZOMETER COMPLETION
 DATE: 2-27-86
 DRY AUGURED 0 TO 25 FT
 WASH BORED 25 TO 58 FT
 DRILLING FLUID Water

PIEZOMETER DEVELOPMENT
 DATE: 5-13-86
 METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT --- FT

DATE	DEPTH	ELEVATION
	<u>17</u>	<u>87</u>
	<u>20</u>	<u>84</u>
	<u>51</u>	<u>53</u>
	<u>56</u>	<u>48</u>
	<u>58</u>	<u>46</u>



REMARKS: Screened in Layer II

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-10

WELL NO: P-4P
 PROJECT NO: 87-028

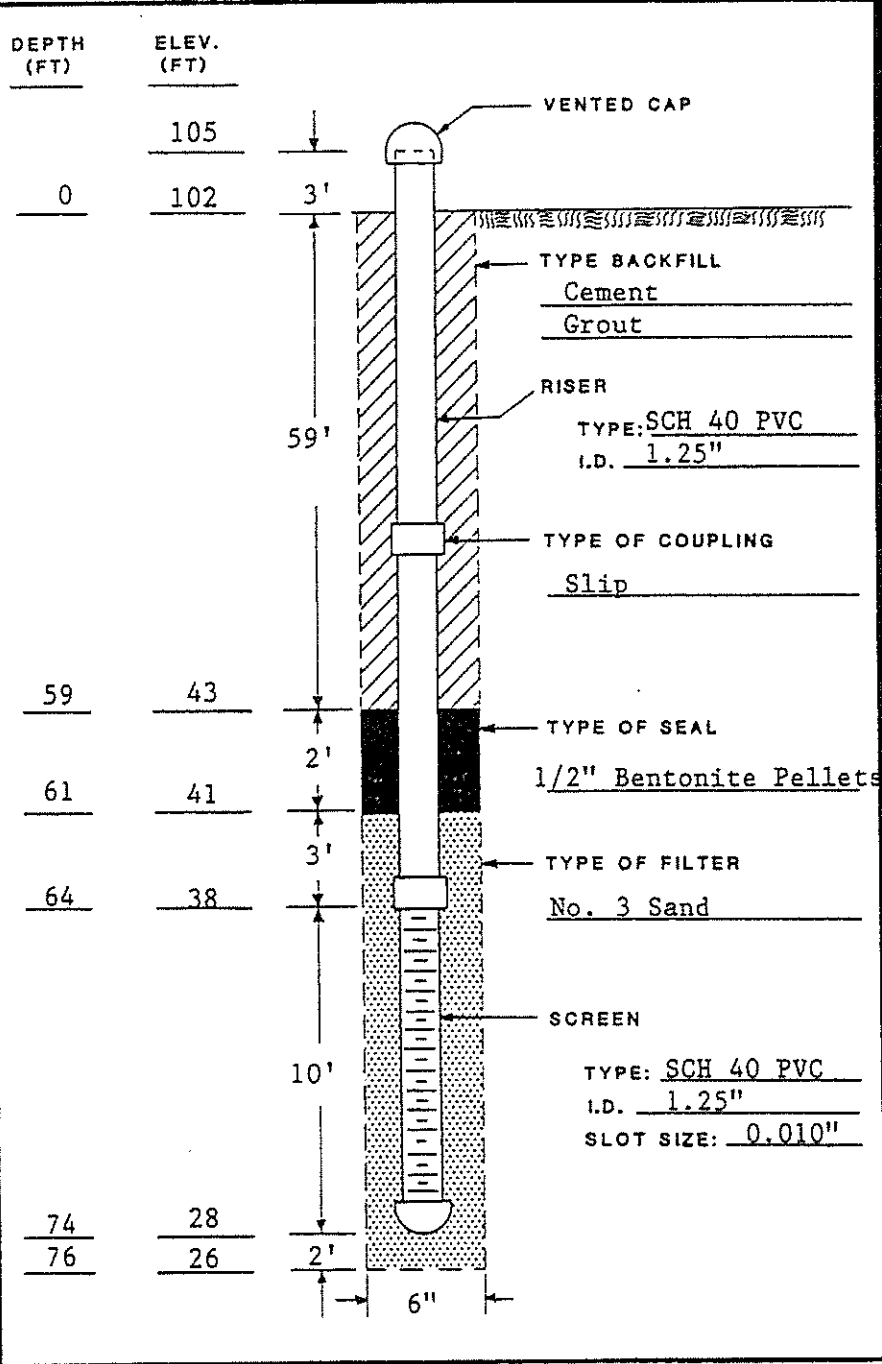
PIEZOMETER COMPLETION
 DATE: 4-29-86
 DRY AUGURED _____ TO _____ FT
 WASH BORED 0 TO 76 FT
 DRILLING FLUID Water

PIEZOMETER DEVELOPMENT
 DATE: 7-10-86
 METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT _____ FT

DATE	DEPTH	ELEVATION
	<u>59</u>	<u>43</u>
	<u>61</u>	<u>41</u>
	<u>64</u>	<u>38</u>
	<u>74</u>	<u>28</u>
	<u>76</u>	<u>26</u>



REMARKS: Screened in Layer III

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill

WELL NO: P-5

CLIENT: West Belt Development, Inc.

PROJECT NO: 87-028

LOCATION: CB-17

PIEZOMETER COMPLETION

DATE: 2-28-86

DRY AUGURED 0 TO 4 FT

WASH BORED 4 TO 85 FT

DRILLING FLUID Water

PIEZOMETER DEVELOPMENT

DATE: 5-2-86

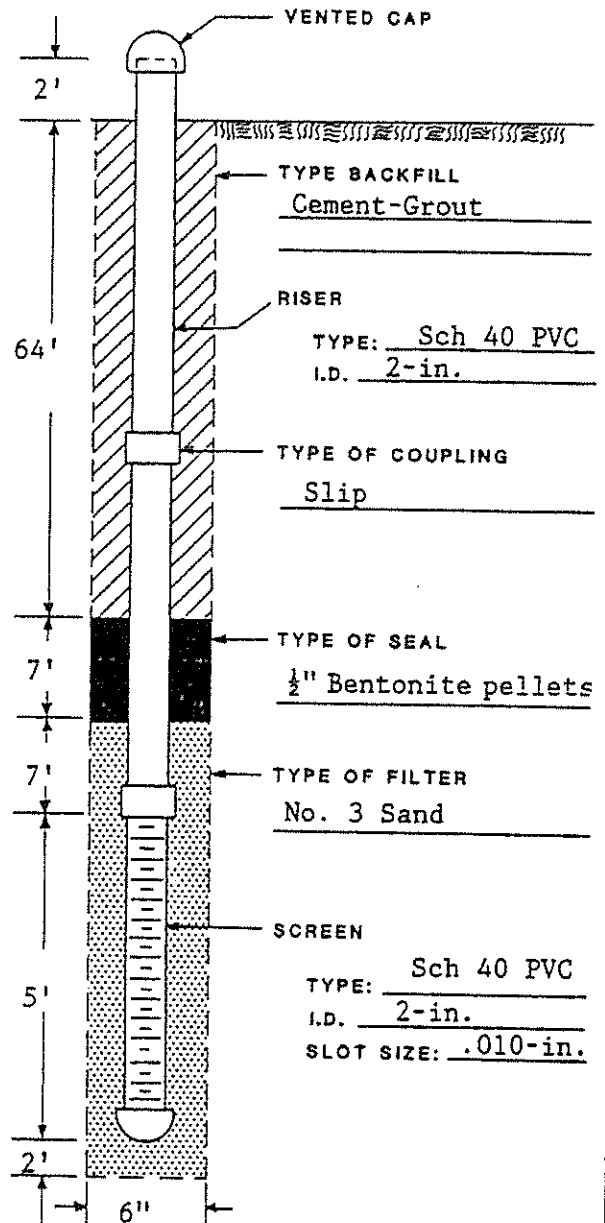
METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT --- FT

DATE	DEPTH	ELEVATION
	64	42
	71	35
	78	28
	83	23
	85	21

DEPTH (FT)	ELEV. (FT)
	108
0	106



REMARKS: Screened in Layer III

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-17

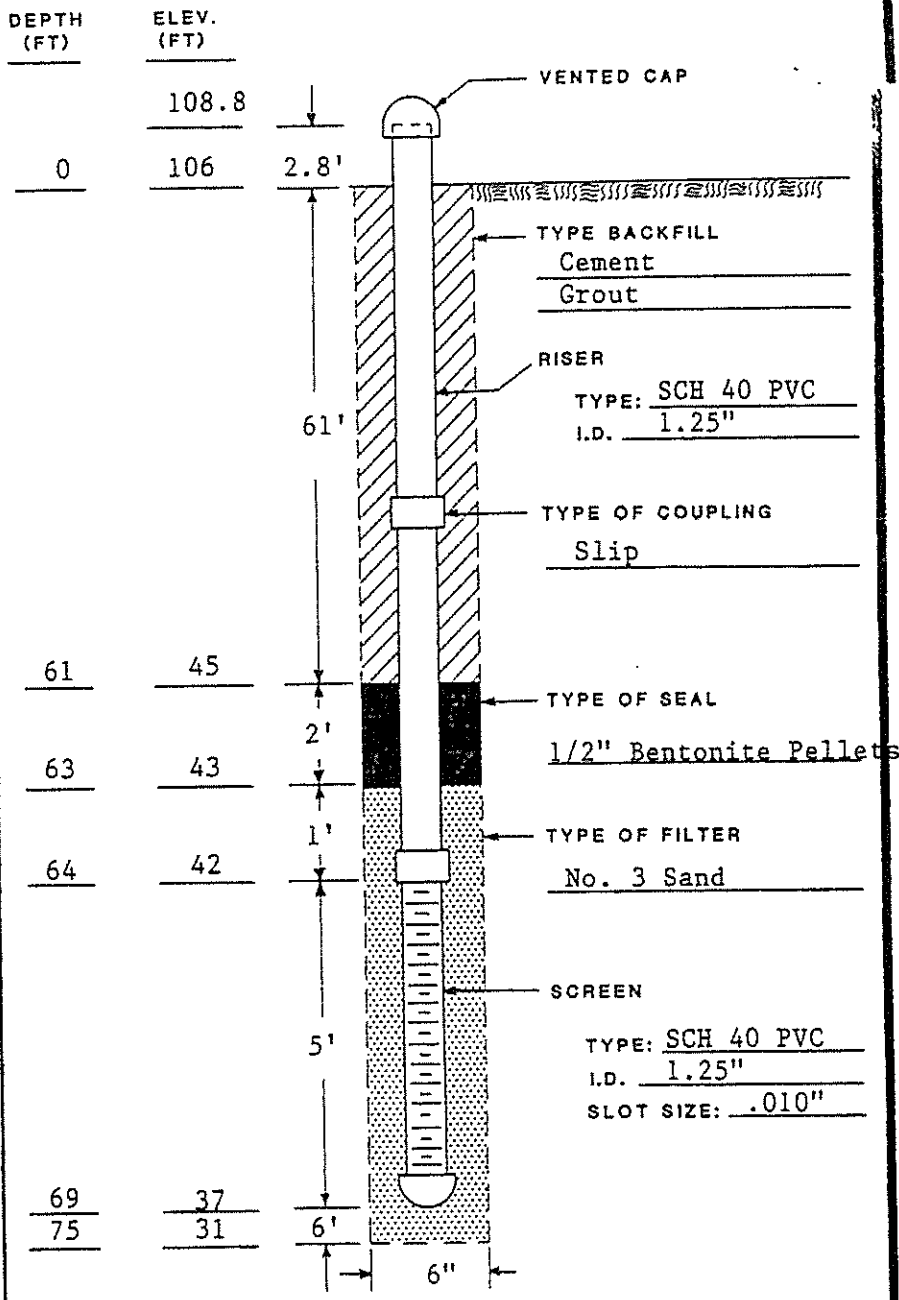
WELL NO: H-3P
 PROJECT NO: 87-028

PIEZOMETER COMPLETION
 DATE: 4-29-86
 DRY AUGURED _____ TO _____ FT
 WASH BORED 0 TO 79 FT
 DRILLING FLUID Water

PIEZOMETER DEVELOPMENT
 DATE: 7-10-86
 METHOD: Compressed Air

WATER LEVEL READINGS
 FREE WATER AT _____ FT

DATE	DEPTH	ELEVATION
	61	45
	63	43
	64	42
	69	37
	75	31



REMARKS: Screened in Layer III

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill

WELL NO: P-5PA

CLIENT: West Belt Development

PROJECT NO: 87-028

LOCATION: CB-17

PIEZOMETER COMPLETION

DATE: 6-23-86

DRY AUGURED _____ TO _____ FT

WASH BORED 0 TO 74 FT

DRILLING FLUID Water

PIEZOMETER DEVELOPMENT

DATE: 7-10-86

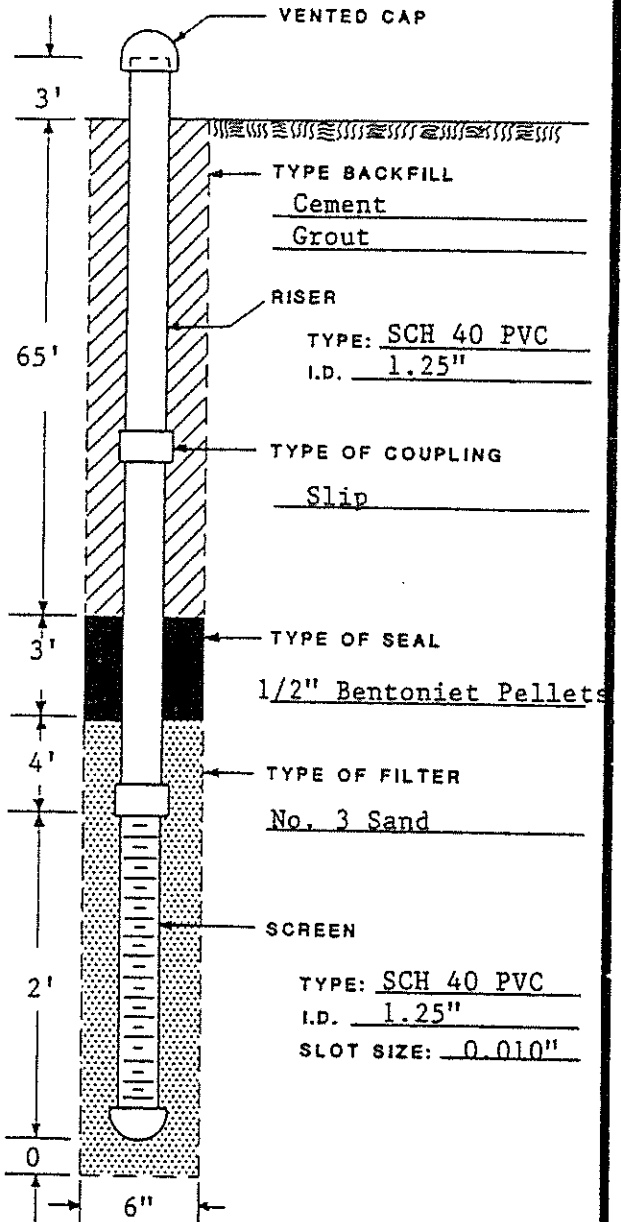
METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT _____ FT

DATE	DEPTH	ELEVATION
	65	41
	68	38
	72	34
	74	32
	0	32

DEPTH (FT)	ELEV. (FT)
0	109
	106
65	41
68	38
72	34
74	32
0	32



REMARKS: Screened in Layer III

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: CB-8

WELL NO: P-6
 PROJECT NO: 87-028

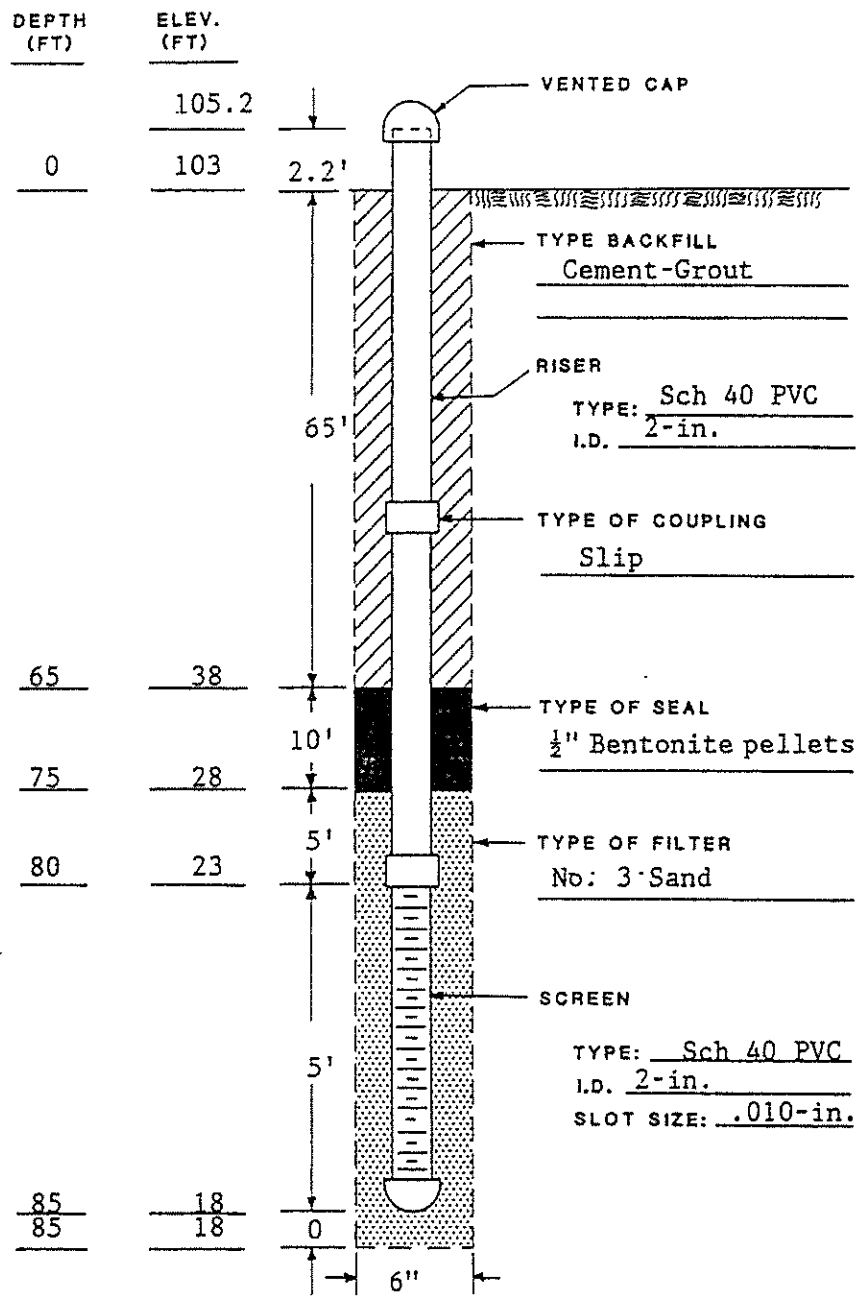
PIEZOMETER COMPLETION
 DATE: 2-28-86
 DRY AUGURED 0 TO 4 FT
 WASH BORED 4 TO 85 FT
 DRILLING FLUID Water

PIEZOMETER DEVELOPMENT
 DATE: 5-13-86
 METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT FT

DATE	DEPTH	ELEVATION
	65	38
	75	28
	80	23
	85	18
	85	18



REMARKS: Screened in Layer III

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 Harris County, Texas
 CLIENT: West Delt Development, Inc.
 Houston, Texas
 LOCATION: CB-23

WELL NO: P-7
 PROJECT NO: 87-028

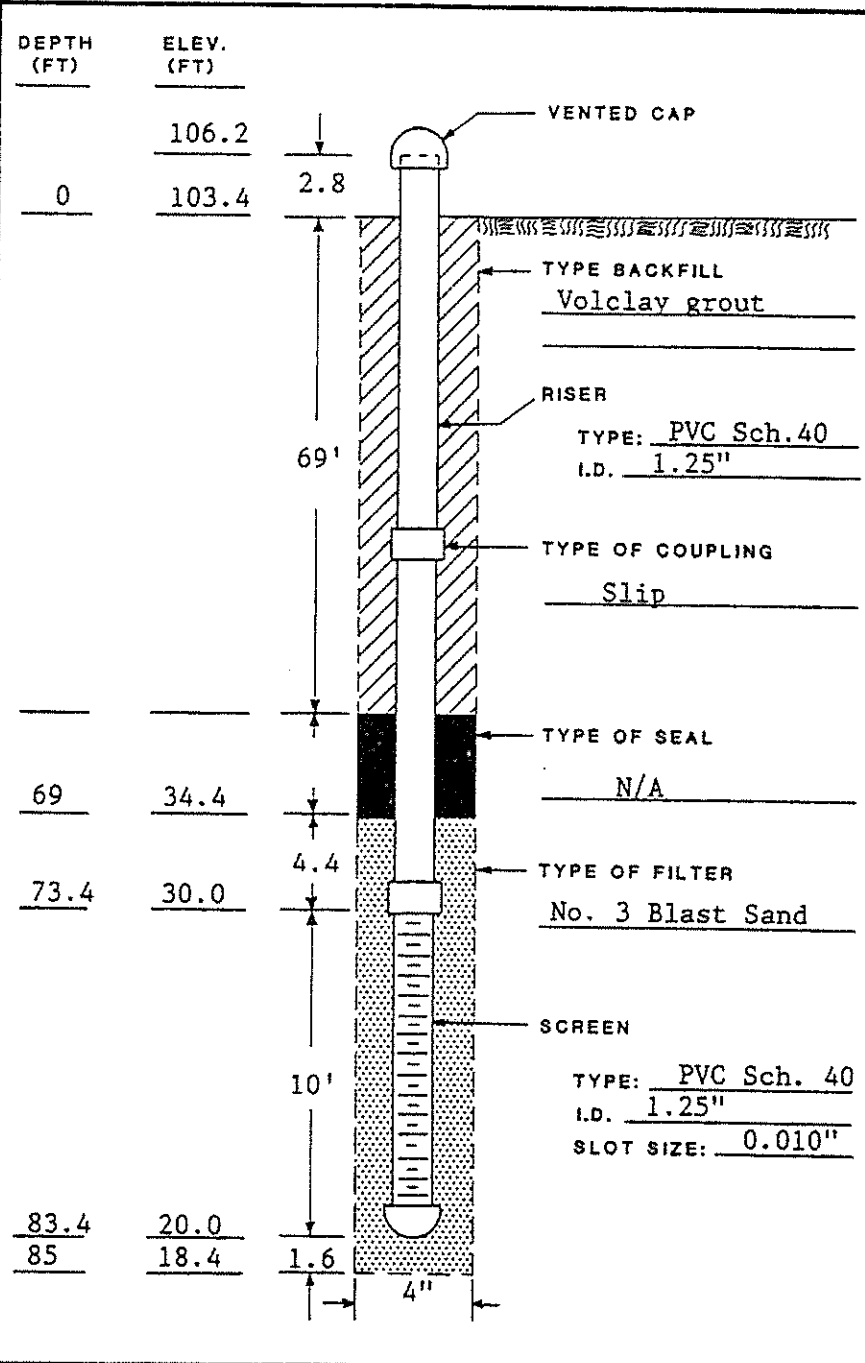
PIEZOMETER COMPLETION
 DATE: 9-3-87
 DRY AUGURED _____ TO _____ FT
 WASH BORED 0 TO 85 FT
 DRILLING FLUID Water

PIEZOMETER DEVELOPMENT
 DATE: 9-9-87
 METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT _____ FT

DATE	DEPTH	ELEVATION
	<u>69</u>	<u>34.4</u>
	<u>73.4</u>	<u>30.0</u>
	<u>83.4</u>	<u>20.0</u>
	<u>85</u>	<u>18.4</u>



REMARKS: Screened in Layer III

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: Near CB-8

WELL NO: P-8
 PROJECT NO: 87-028

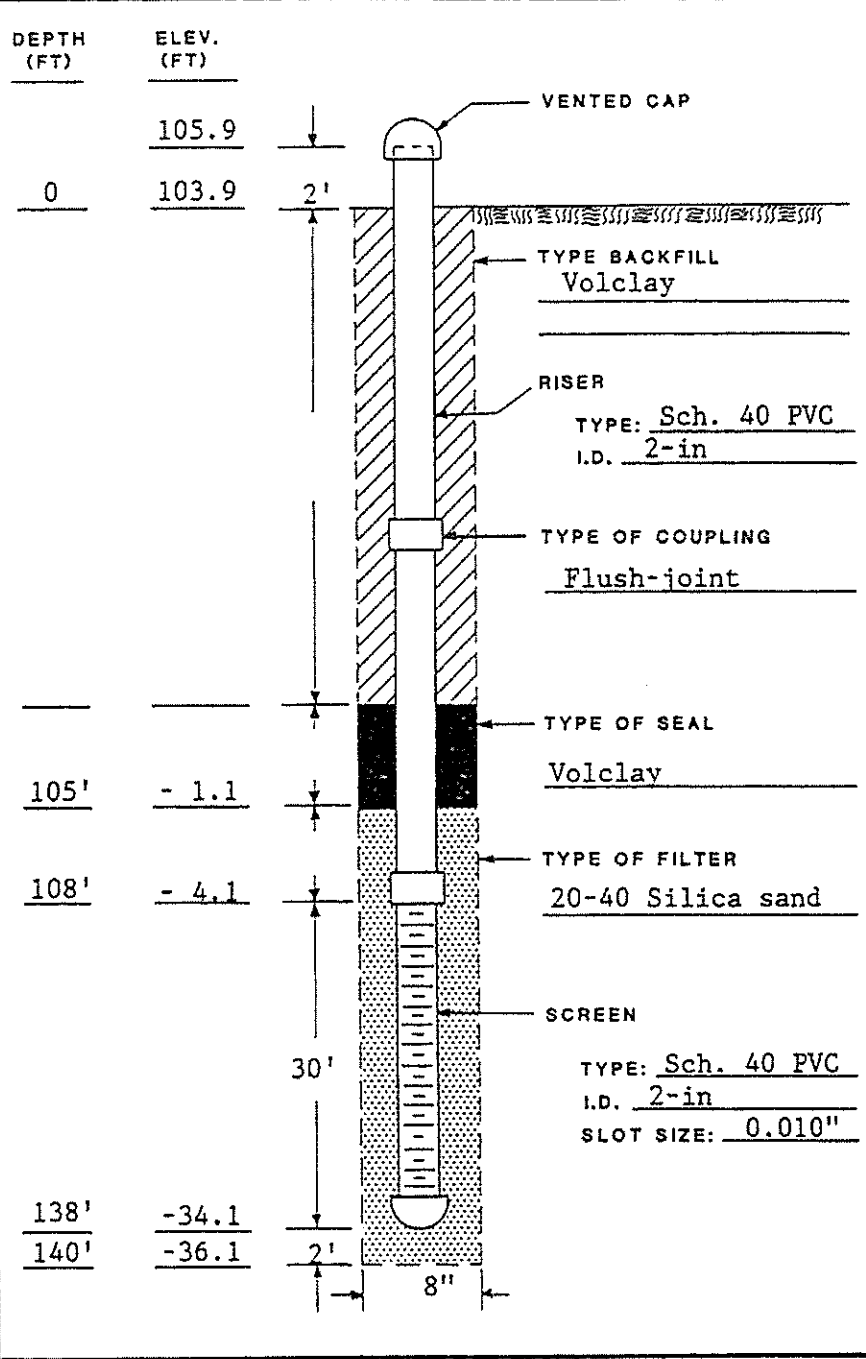
PIEZOMETER COMPLETION
 DATE: 6-17-88
 DRY AUGURED _____ TO _____ FT
 WASH BORED 0 TO 140 FT
 DRILLING FLUID Potable Water

PIEZOMETER DEVELOPMENT
 DATE: 6-22-88 & 7-9-88
 METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT _____ FT

DATE	DEPTH	ELEVATION
	<u>105'</u>	<u>- 1.1</u>
	<u>108'</u>	<u>- 4.1</u>
	<u>138'</u>	<u>-34.1</u>
	<u>140'</u>	<u>-36.1</u>



REMARKS: Screened in Layer IV

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill

WELL NO: P-9

CLIENT: West Belt Development, Inc.

PROJECT NO: 87-028

LOCATION: Near CB-14

PIEZOMETER COMPLETION

DATE: 6-16-88

DRY AUGURED _____ TO _____ FT

WASH BORED 0 TO 150 FT

DRILLING FLUID Potable Water

PIEZOMETER DEVELOPMENT

DATE: 6-28-88 7-9-88

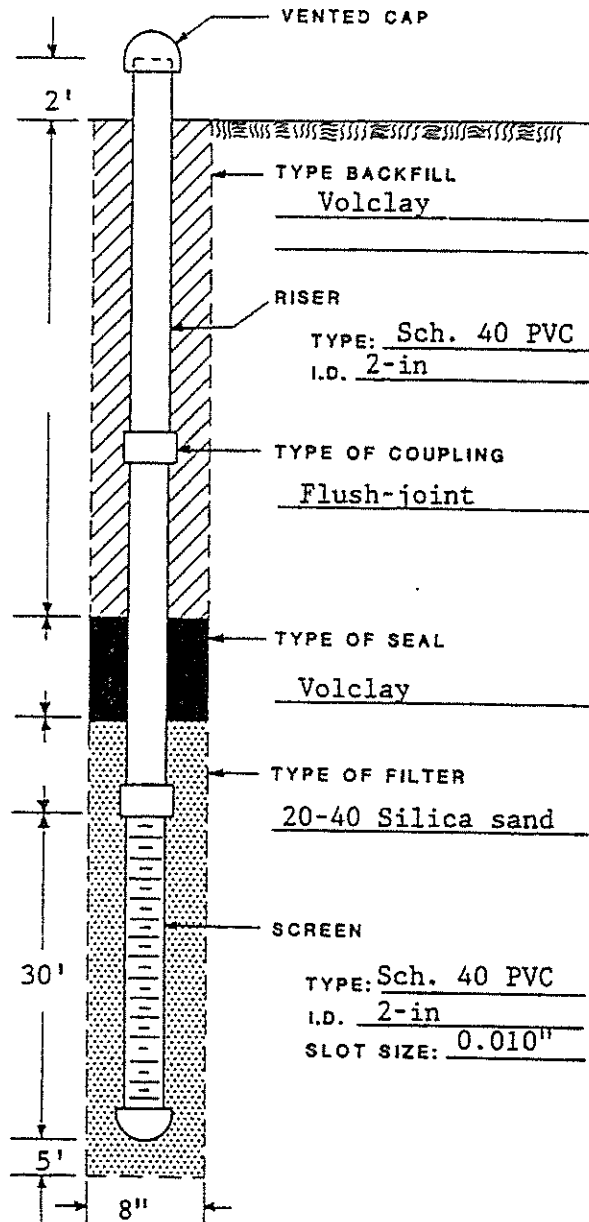
METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT _____ FT

DATE	DEPTH	ELEVATION
	109'	- 4.9
	115'	-10.9
	145'	-40.9
	150'	-50.9

DEPTH (FT)	ELEV. (FT)
	106.1
0	104.1



REMARKS: Screened in Layer IV

PIEZOMETER INSTALLATION REPORT

PROJECT: West Belt Landfill
 CLIENT: West Belt Development, Inc.
 LOCATION: North of CB-4

WELL NO: P-10
 PROJECT NO: 87-028

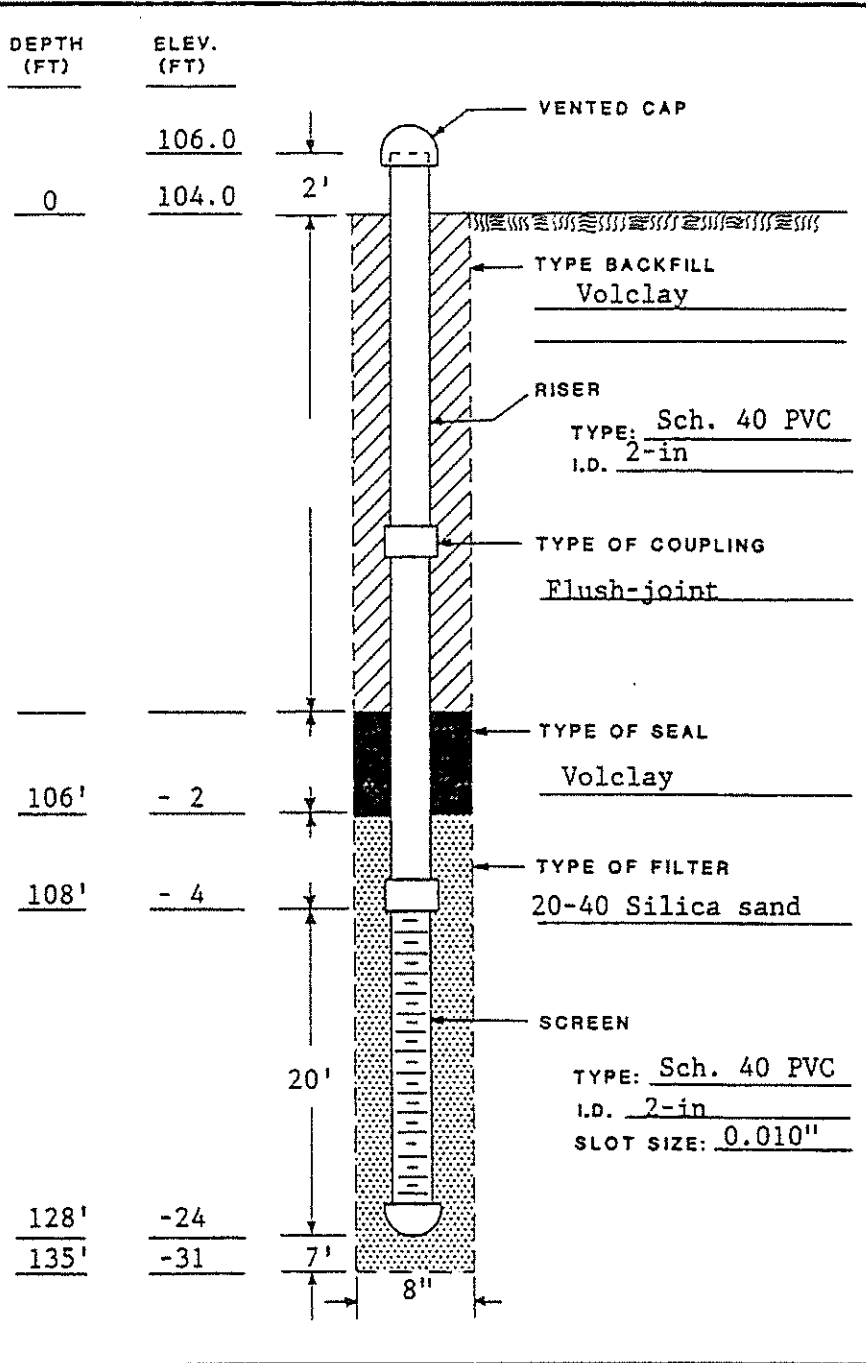
PIEZOMETER COMPLETION
 DATE: 6-15-88
 DRY AUGURED _____ TO _____ FT
 WASH BORED 0 TO 135 FT
 DRILLING FLUID Potable Water

PIEZOMETER DEVELOPMENT
 DATE: 6-28-88 - 7-9-88
 METHOD: Compressed Air

WATER LEVEL READINGS

FREE WATER AT _____ FT

DATE	DEPTH	ELEVATION
	106'	- 2
	108'	- 4
	128'	-24
	135'	-31

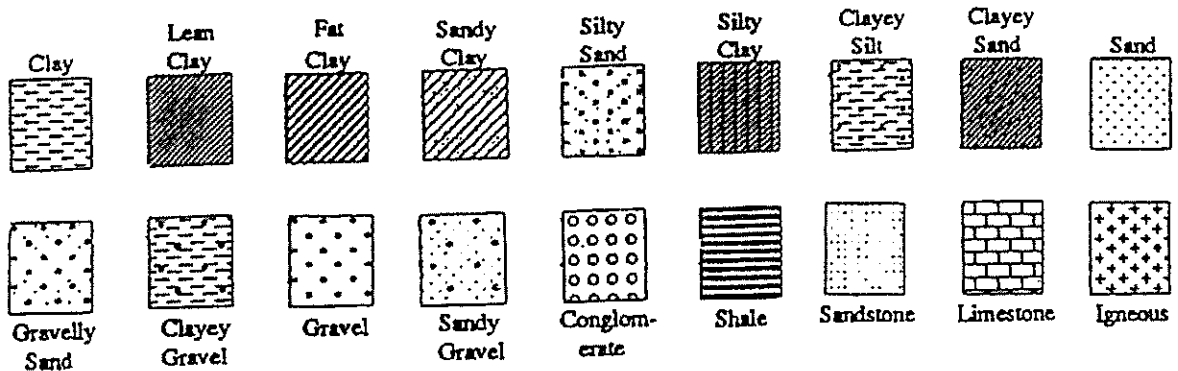


REMARKS: Screened in Layer IV

MONITORING WELL LOGS

GENERAL NOTES

SOIL OR ROCK TYPES (shown in symbols column)



DRILLING AND SAMPLING SYMBOLS:

- | | |
|---|--------------------|
| U : Thin-walled Tube - 3" O.D., unless otherwise noted | A : Auger Sample |
| S : Split Barrel Sampler - 2" O.D., unless otherwise noted | W : Wash Sample |
| Example: 25 = 25 blows/12" after 6" seating interval; 50 / 7 = 50 blows / 7" after 6" seating interval; REF = 50 blows < 6" | P : Packer Test |
| C : Double Tube Core Barrel | D : Denison Sample |
| T : THD Cone Penetrometer - Example: T60 = 60 blows/12"; T4.5" = 100 blows/4.5" | |

RELATIVE DENSITY OF COARSE-GRAINED SOILS:

Penetration Resistance	Relative Density
Blows/ft 0 - 4	Very loose
4 - 10	Loose
10 - 30	Medium dense
30 - 50	Dense
Over 50	Very Dense

CONSISTENCY OF FINE-GRAINED SOILS:

Unconfined Compressive Strength, C_u , c_f	Consistency
Less than 0.25	Very soft
0.25 to 0.50	Soft
0.50 to 1.00	Firm
1.00 to 2.00	Stiff
2.00 to 4.00	Very stiff
4.00 and higher	Hard

TERMS CHARACTERIZING SOIL STRUCTURE:

- Slickensided** : Having inclined planes of weakness that are slick and glossy in appearance.
- Fissured** : Containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
- Laminated** : Composed of thin layers of varying color and texture.
- Interbedded** : Composed of alternate layers of different soil types.
- Calcareous** : Containing appreciable quantities of calcium carbonate.
- Well graded** : Having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
- Poorly Graded** : Predominantly of one grain size, or having a range of sizes with some intermediate size missing.

DEGREE OF WEATHERING:

- Unweathered** : No visible sign of decomposition or discoloration
- Slightly weathered** : Slight discoloration inwards from open fractures, otherwise similar to unweathered
- Moderately weathered** : Discoloration throughout, strength somewhat less than unweathered rock
- Highly weathered** : Discoloration throughout, strength much less than unweathered rock

SUBSURFACE CONDITIONS:

Soil and rock descriptions on the boring logs are a compilation of field data as well as from laboratory testing of samples on those strata for which laboratory classification test results are presented on the boring logs. These classifications are based only on the actual samples tested, and classification is then assigned to the remainder of the stratum interval based on visual classification. If laboratory classification test results are not presented on the boring log for a particular stratum, then that stratum was classified by visual-manual procedures only. The stratification lines represent the approximately boundary between materials and the transition can be gradual.

Classification of soils based upon visual-manual procedures were performed in general accordance with ASTM Standard D 2488. Classification of soils based upon laboratory test results was performed in general accordance with ASTM Standard D 2487.

Water-level observations have been made in the borings at the times indicated. It must be noted that fluctuations in the ground-water level may occur due to variations in rainfall, hydraulic conductivity of soil strata, construction activity, and other factors.

LOG OF BORING NO. MW-6

Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
Location: 29°51'23.9"/95°33'41.7" Surface El.: 104.5' MSL														
5			SANDY CLAY, tan w/gray streaks, stiff, w/trace calcareous nodules, w/rootlets.											
10			- w/ferrous staining below 10.0'.											
15														
20				21.0										
25			CLAYEY SAND, light gray, firm, w/ferrous stains and calcareous nodules.											
30			- w/sand layers from 29.0' to 32.0' (wet).											
35				35.0										
40			SILTY CLAY, reddish brown and gray, stiff.											
45				40.0										
50			SAND, reddish brown, fine grained, subrounded to rounded, poorly sorted.											
Completion Depth: 63.0 Date Boring Started: 2/3/95 Date Boring Completed: 2/3/95 Engineer/Geologist: Stamoulis Project No.: 9502-001				Remarks: See monitoring-well data sheets Plate D.1, E.1 and E.17 for well specifications.										

Continued Next Page

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. **PLATE B.2**

LOG OF BORING NO. MW-6

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	Location: 29°51'23.9"/95°33'41.7" Surface El.: 104.5 ' MSL	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
MATERIAL DESCRIPTION														
55		[Symbol: Sand]	SAND, reddish brown, fine grained, subrounded to rounded, poorly sorted.										8	
60		[Symbol: Clay]	CLAY, reddish brown, hard, dry.											
63.0		[Symbol: Clay]												
65														
70														
75														
80														
85														
90														
95														
100														

Completion Depth: **63.0**
 Date Boring Started: **2/3/95**
 Date Boring Completed: **2/3/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: **See monitoring-well data sheets Plate D.1, E.1 and E.17 for well specifications.**

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. **PLATE B.2**
 Insitu, the transition may be gradual.

LOG OF BORING NO. MW-7

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	ROD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
Location: 29°51'27.7"/95°33'26.5" Surface El.: 102.4' MSL														
		3.0	SANDY CLAY, brown, firm, w/organics, w/trace calcareous nodules.											
5			SANDY CLAY, light brown w/light gray streaks, firm, w/occasional clay pockets.											
10														
15														
20		20.0	- tan w/ferrous staining and w/increased sand content below 17.0'.											
25			SILTY SAND, tan, moist.											
30			- w/clay layers from 27.0' to 28.0'.											
35			- w/clay layers from 32.0' to 33.0'.											
40		36.0	SAND, slightly silty, light brown, to reddish brown, very fine grained to fine grained, subrounded to rounded, well graded.											
45														
50														
Completion Depth: 68.0			Remarks: See monitoring-well data sheets Plate D.2, E.2 and E.18 for well specifications.											
Date Boring Started: 2/7/95														
Date Boring Completed: 2/7/95														
Engineer/Geologist: Stamoulis														
Project No.: 9502-001			<i>Continued Next Page</i>											

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. **PLATE B.3**
In situ, the transition may be gradual.

LOG OF BORING NO. MW-7

**Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas**



Depth, feet	Samples	Symbol / USCS	Location: 29°51'27.7"/95°33'26.5" Surface El.: 102.4 ' MSL	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
MATERIAL DESCRIPTION														
55		•••••	SAND (silty), light reddish brown, very fine grained to fine grained, subrounded to rounded, well graded.										18	
60				66.0										
65		//	CLAY, reddish brown, hard, dry.	68.0										
70														
75														
80														
85														
90														
95														
100														

Completion Depth: **68.0**
 Date Boring Started: **2/7/95**
 Date Boring Completed: **2/7/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: **See monitoring-well data sheets Plate D.2, E.2 and E.18 for well specifications.**

LOG OF BORING NO. MW-8

Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RCD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'27.6"/95°33'20.2" Surface El.: 102.2' MSL											
		Hatched	SANDY CLAY, dark gray, firm, w/rootlets, w/trace calcareous nodules.											
5		Hatched	SANDY CLAY, light brown to tan, firm to stiff.	4.0										
10		Hatched	CLAY, reddish brown, very stiff, w/calcareous nodules, ferrous staining.	10.0										
15		Hatched												
20		Hatched	SANDY CLAY, light brown to tan, firm to stiff, w/calcareous nodules, w/trace ferrous staining.	18.0										
25		Hatched												
30		Dotted	SAND, tan, very fine grained to fine grained, subrounded to rounded, well graded.	25.0										
35		Dotted												
40		Dotted												
45		Dotted												
50		Dotted		50.0										

Completion Depth: 64.0 Date Boring Started: 2/7/95 Date Boring Completed: 2/7/95 Engineer/Geologist: Stamoullis Project No.: 9502-001	Remarks: See monitoring well data sheets Plate D.3, E.3 and E.19 for well specifications.
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Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. Insitu, the transition may be gradual. **PLATE B.4**

LOG OF BORING NO. MW-8

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'27.6"/95°33'20.2" Surface El.: 102.2 ' MSL											
-55			SAND (silty), tan, vary fine grained to fine grained, subrounded to rounded, well graded.										30	
-60														
			63.0											
			CLAY, reddish brown, hard, dry.	64.0										
-65														
-70														
-75														
-80														
-85														
-90														
-95														
-100														
Completion Depth: 64.0 Date Boring Started: 2/7/95 Date Boring Completed: 2/7/95 Engineer/Geologist: Stamoulis Project No.: 9502-001				Remarks: See monitoring well data sheets Plate D.3, E.3 and E.19 for well specifications.										

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. Insitu, the transition may be gradual. **PLATE B.4**

LOG OF BORING NO. MW-9

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	ROD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'21.9"/95°33'12.2" Surface El.: 105.2' MSL											
		[Diagonal Hatching]	SANDY CLAY, gray, firm, w/organics.											
5				5.0										
		[Diagonal Hatching]	SANDY CLAY, tan, stiff, w/trace calcareous nodules.											
				9.0										
10		[Diagonal Hatching]	SILTY CLAY, tan to light brown, very stiff, w/calcareous nodules, trace ferrous staining.											
15		[Diagonal Hatching]												
20		[Diagonal Hatching]												
25		[Diagonal Hatching]	- increase ferrous staining content below 22.0'.											
30		[Diagonal Hatching]												
35		[Diagonal Hatching]												
40		[Diagonal Hatching]												
45		[Diagonal Hatching]												
				43.0										
45		[Dotted]	SAND, reddish brown, very fine grained, subrounded to rounded, well graded.											
50		[Dotted]												

Completion Depth: **55.0**
 Date Boring Started: **2/16/95**
 Date Boring Completed: **2/16/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: See monitoring-well data sheets Plate D.4, E.4 and E.20 for well specifications.

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LOG OF BORING NO. MW-9

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'21.9"/95°33'12.2" Surface El.: 105.2 ' MSL											
55		●●●●		53.5										
55		▨▨▨▨	CLAY, reddish brown, hard, dry.	55.0										
60														
65														
70														
75														
80														
85														
90														
95														
100														
Completion Depth: 55.0 Date Boring Started: 2/16/95 Date Boring Completed: 2/16/95 Engineer/Geologist: Stamoulis Project No.: 9502-001				Remarks: See monitoring-well data sheets Plate D.4, E.4 and E.20 for well specifications.										

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. PLATE B.5
Insitu, the transition may be gradual.

LOG OF BORING NO. MW-10

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'28.0"/95°33'11.6" Surface El.: 102.2' MSL											
5			SANDY CLAY, gray, soft, w/organics, (moist).											
				6.0										
10			SANDY CLAY, light brown, firm, w/calcareous nodules.											
				13.0										
15			SILTY CLAY, tan to light brown, stiff, w/trace calcareous nodules, trace ferrous staining, w/sand partings.											
				22.0										
25			SILTY CLAY, tan, hard, w/ferrous staining.											
				39.0										
30			- light brown w/increase in calcareous content below 30.0'.											
40			SAND, reddish brown, very fine grained to fine grained, subrounded to rounded, well graded.											
45														
50													14	

Completion Depth: **60.0**
 Date Boring Started: **2/17/95**
 Date Boring Completed: **2/17/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: See monitoring-well data sheets Plate D.5, E.5 and E.21 for well specifications.

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LOG OF BORING NO. MW-10

Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	Location: 29°51'28.0"/95°33'11.6" Surface El.: 102.2 ' MSL	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			MATERIAL DESCRIPTION											
55		•••••		57.0										
60		▨▨▨▨▨	CLAY, reddish brown, hard, dry.	60.0										
65														
70														
75														
80														
85														
90														
95														

Completion Depth: **60.0**
 Date Boring Started: **2/17/95**
 Date Boring Completed: **2/17/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: **See monitoring-well data sheets Plate D.5, E.5 and E.21 for well specifications.**

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. Insitu, the transition may be gradual. **PLATE B.6**

LOG OF BORING NO. MW-11

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
Location: 29°51'21.8"/95°32'56.3" Surface El.: 102.6' MSL														
5			SANDY CLAY, brown to dark gray, firm, w/calcareous nodules.											
10			- reddish brown below 10.0'.											
13.0														
15			SILTY CLAY, light brown to brown, firm, w/calcareous nodules.											
20			- very stiff below 18.0'. - light brown to tan below 20.0'.											
25			- light reddish brown, to reddish brown, w/calcareous nodules, hard, w/ferrous staining at 25.0'.											
30														
35			- reddish brown below 34.0'.											
43.0														
45			SAND (silty), reddish brown, very fine grained to fine grained, subrounded to rounded, well graded.											
50													29	
Completion Depth: 54.0 Date Boring Started: 2/17/95 Date Boring Completed: 2/17/95 Engineer/Geologist: Stamoulis Project No.: 9502-001				Remarks: See monitoring-well data sheets Plate D.6, E.6 and E.22 for well specifications.										

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Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. PLATE B.7
Insitu, the transition may be gradual.

LOG OF BORING NO. MW-11

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	Location: 29°51'21.8"/95°32'56.3" Surface El.: 102.6' MSL	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			MATERIAL DESCRIPTION											
		●●●●		53.0										
		▨▨▨▨	CLAY, reddish brown, hard, dry.	54.0										
55														
60														
65														
70														
75														
80														
85														
90														
95														
100														
Completion Depth: 54.0 Date Boring Started: 2/17/95 Date Boring Completed: 2/17/95 Engineer/Geologist: Stamoulis Project No.: 9502-001				Remarks: See monitoring-well data sheets Plate D.6, E.6 and E.22 for well specifications.										

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. Insitu, the transition may be gradual. PLATE B.7

LOG OF BORING NO. MW-12

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	ROD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'11.2"/95°32'55.8" Surface El.: 102.4 ' MSL											
5		SANDY CLAY	SANDY CLAY, brown to light gray, firm, w/organics, dry.											
10		SANDY CLAY	- tan to light brown, firm, w/ferrous staining below 12.0'. 14.0											
15		SAND	SAND, light gray, w/clay pockets, silty, very fine grained to fine grained, subrounded to rounded, well graded, (moist).											
20		SAND	- tan to light brown below 23.0'.											
25		SAND	- w/ferrous staining below 32.0'.											
30		SAND	- tan below 37.0'.											
35		SAND												
40		SAND												
45		SAND												
50		SAND												

Completion Depth: **55.0**
Date Boring Started: **2/15/95**
Date Boring Completed: **2/15/95**
Engineer/Geologist: **Stamoulis**
Project No.: **9502-001**

Remarks: **See monitoring-well data sheets Plate D.7, E.7 and E.23 for well specifications.**

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LOG OF BORING NO. MW-12

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'11.2"/95°32'55.8" Surface El.: 102.4' MSL											
55		54.5	CLAY, reddish brown, hard, dry.											
55		55.0	CLAY, reddish brown, hard, dry.											
60														
65														
70														
75														
80														
85														
90														
95														
100														
Completion Depth: 55.0 Date Boring Started: 2/15/95 Date Boring Completed: 2/15/95 Engineer/Geologist: Stamoulis Project No.: 9502-001				Remarks: See monitoring-well data sheets Plate D.7, E.7 and E.23 for well specifications.										

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. PLATE B.8

LOG OF BORING NO. MW-13

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'00.5"/95°32'56.3" Surface El.: 102.1' MSL											
		2.0	SANDY CLAY, light brown, w/organics, w/ferrous staining.											
5			SILTY CLAY, light brown to tan, firm, w/trace calcareous nodules.											
10			- light brown w/ferrous staining below 11.0'.											
		14.0												
15			SILTY SAND, light gray, very fine grained to fine grained, subrounded to rounded, well graded, (moist).											
20														
25														
30														
35		35.0												
36			SAND, tan, very fine grained to fine grained, subrounded to rounded, well graded.											
40														
45														
50		50.0												

Completion Depth: 57.0 Date Boring Started: 2/15/95 Date Boring Completed: 2/15/95 Engineer/Geologist: Stamoulis Project No.: 9502-001	Remarks: See monitoring-well data sheets Plate D.8, E.8 and E.24 for well specifications.
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LOG OF BORING NO. MW-13

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	Location: 29°51'00.5"/95°32'56.3" Surface El.: 102.1 ' MSL	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			MATERIAL DESCRIPTION											
55		•••••	SAND, reddish brown, very fine grained to fine grained, subrounded to rounded, well graded.											
		//	CLAY, reddish brown, hard, dry.											
60														
65														
70														
75														
80														
85														
90														
95														
100														
Completion Depth: 57.0 Date Boring Started: 2/15/95 Date Boring Completed: 2/15/95 Engineer/Geologist: Stamoulis Project No.: 9502-001				Remarks: See monitoring-well data sheets Plate D.8, E.8 and E.24 for well specifications.										

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. Insitu, the transition may be gradual. **PLATE B.9**

LOG OF BORING NO. MW-14

Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	Location: 29°51'10.8"/95°33'12.1" Surface El.: 103.5' MSL	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			MATERIAL DESCRIPTION											
5		S	SANDY CLAY, gray, stiff, w/trace calcareous nodules, w/organics. - light brown to tan below 8.0'.											
10				12.0										
15			SANDY CLAY, light brown, firm to stiff, w/calcareous nodules.	14.0										
20			CLAYEY SAND, tan to light brown, stiff.											
25				26.0										
30			SILTY CLAY, light brown, stiff, w/calcareous nodules. - reddish brown, w/calcareous nodules below 31.0'.											
35														
40														
45				47.0										
50		S	SAND, tan to reddish brown, very fine grained, subrounded to rounded, well graded.											

Completion Depth: **60.0**
 Date Boring Started: **2/24/95**
 Date Boring Completed: **2/24/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: **See monitoring-well data sheets Plate D.9, E.9 and E.25 for well specifications.**

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Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. PLATE B.10

LOG OF BORING NO. MW-14

Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RCO	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
Location: 29°51'10.8"/95°33'12.1" Surface El.: 103.5' MSL														
55		○											6	
59.0				59.0										
60		▨	CLAY, reddish brown, hard, dry.	60.0										
65														
70														
75														
80														
85														
90														
95														
100														
Completion Depth: 60.0 Date Boring Started: 2/24/95 Date Boring Completed: 2/24/95 Engineer/Geologist: Stamoulis Project No.: 9502-001				Remarks: See monitoring-well data sheets Plate D.9, E.9 and E.25 for well specifications.										

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. PLATE B.10
Insitu, the transition may be gradual.

LOG OF BORING NO. MW-15

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	ROD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'00.8"/95°33'12.1" Surface El.: 104.0' MSL											
			SANDY CLAY, dark brown, hard, dry, w/rock fragments, (fill). 3.0											
5			SANDY CLAY, brown to dark gray, very stiff. - tan below 9.0'. - w/increase in sand content at 14.0'. 23.0											
10														
15														
20														
25			SAND, light gray, very fine grained to fine grained, subrounded to rounded, well graded, w/clay layers. 27.0											
30			CLAYEY SAND, light brown, firm. 33.0											
35			SILTY SAND, light brown, very fine grained, subrounded to rounded, well graded. - reddish brown below 44.0'. 50.0											
40														
45														
50														

Completion Depth: **70.0**
 Date Boring Started: **2/14/95**
 Date Boring Completed: **2/14/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: **See monitoring-well data sheets Plate D.10, E.10 and E.26 for well specifications.**

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LOG OF BORING NO. MW-16

Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
5		/ / / / /	SANDY CLAY, brown, stiff, w/ferrous staining, w/calcareous nodules and organics.											
			6.0											
10		/ / / / /	SANDY CLAY, tan to light brown, very stiff.											
15														
			18.0											
20		SAND, tan, very fine grained to fine grained, subrounded to rounded, well graded.											
25			- light brown, moist at 26.0'.											
30														
			35.0											
35		x x x x x	SILTY SAND, reddish brown, very fine grained to fine grained, subrounded to rounded, well graded.											
40														
45														
			50.0											
50														

Completion Depth: **65.0**
 Date Boring Started: **2/14/95**
 Date Boring Completed: **2/14/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: **See monitoring-well data sheets Plate D.11, E.11 and E.27 for well specifications.**

Continued Next Page

LOG OF BORING NO. MW-17

Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	ROD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Pleiticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
Location: 29°51'06.6"/95°33'21.1" Surface El.: 103.0' MSL														
5		[Hatched]	SANDY CLAY, brown, firm to stiff, w/trace calcareous nodules, w/trace ferrous staining and organics.											
10			- tan below 9.0'.											
14.0														
15		[Dotted]	SAND (silty), tan to light brown, very fine grained, subrounded to rounded, well graded.											
20														
25														
30														
30.0														
34.0		[Hatched]	CLAY, light brown to tan, stiff w/trace calcareous nodules, w/ferrous staining.											
35		[Dotted]	SAND (silty), tan to light brown, very fine grained, subrounded to rounded, well graded.											
40			- tan to brown below 40.0'.											
45														
50														

Completion Depth: 66.0
Date Boring Started: 2/13/95
Date Boring Completed: 2/13/95
Engineer/Geologist: Stamoulis
Project No.: 9502-001

Remarks: See monitoring-well data sheets Plate D.12, E.12 and E.28 for well specifications.

Continued Next Page

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. PLATE B.13
insitu, the transition may be gradual.

LOG OF BORING NO. MW-17

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	ROD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'06.6"/95°33'21.1" Surface El.: 103.0' MSL											
55			SAND (silty), tan to brown, very fine grained, subrounded to rounded, well graded.										16	
65			CLAY, reddish brown, hard, dry.	65.0										
66				66.0										
70														
75														
80														
85														
90														
95														
100														

Completion Depth: **66.0**
 Date Boring Started: **2/13/95**
 Date Boring Completed: **2/13/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: **See monitoring-well data sheets Plate D.12, E.12 and E.28 for well specifications.**

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. **PLATE B.13**
 Insitu, the transition may be gradual.

LOG OF BORING NO. MW-18

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'10.3"/95°33'26.7" Surface El.: 103.4' MSL											
		[Hatched]	SANDY CLAY, w/sand, light brown, w/rock fragments, (fill). 4.5											
5		[Hatched]	SANDY CLAY, tan to light brown, stiff, w/ferrous staining, w/trace calcareous nodules. - w/increase in sand content at 9.0'. 15.0											
10		[Dotted]	SAND, tan, dry, very fine grained, subrounded to rounded, well graded, w/occasional clay pockets. 25.0											
15		[Hatched]	SANDY CLAY, light brown to brown, stiff, (moist). 32.0											
20		[Hatched]	CLAY, light brown to reddish brown, very stiff, w/trace ferrous staining. 36.0											
25		[Dotted]	SAND, light brown to reddish brown, very fine grained to fine grained, subrounded to rounded, well graded.											
30														
35														
40														
45														
50														

Completion Depth: 70.0 Date Boring Started: 2/6/95 Date Boring Completed: 2/6/95 Engineer/Geologist: Stamoulis Project No.: 9502-001	Remarks: See monitoring-well data sheets Plate D.13, E.13 and E.29 for well specifications.
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Continued Next Page

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. PLATE B.14

LOG OF BORING NO. MW-18

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	ROD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'10.3"/95°33'26.7" Surface El.: 103.4' MSL											
-55			SAND, light brown to reddish brown, very fine grained to fine grained, subrounded to rounded, well graded.										11	
-60														
-65														
-68.0														
-70			CLAY, reddish brown, hard, dry.											
-70.0														
-75														
-80														
-85														
-90														
-95														
+00														
Completion Depth: 70.0 Date Boring Started: 2/6/95 Date Boring Completed: 2/6/95 Engineer/Geologist: Stamoulis Project No.: 9502-001				Remarks: See monitoring-well data sheets Plate D.13, E.13 and E.29 for well specifications.										

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. PLATE B.14

LOG OF BORING NO. MW-19

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	ROD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'07.6"/95°33'31.6" Surface El.: 106.1' MSL											
			CLAY, light brown, w/rock fragments (fill). 1.5											
5			SANDY CLAY, brown, stiff, w/calcareous nodules, brick fragments, trace sand (fill). 6.0											
10			SANDY CLAY, dark gray, firm, w/calcareous nodules. 16.0											
15			SAND, gray, fine grained, subrounded to rounded, poorly sorted, moist @ 17.0', wet at 18.0' to 19.0'. 31.0											
20			- w/clay layers from 25.0' to 26.0'. 31.0											
25			- slightly silty below 30.0'. 31.0											
30			SANDY CLAY, tan, stiff, w/trace calcareous nodules, and ferrous stains. 42.0											
35			SAND, tan to reddish brown, very fine grained to fine grained, subrounded to rounded, poorly sorted. 42.0											
40														
45														
50														

Completion Depth: **63.0**
 Date Boring Started: **2/4/95**
 Date Boring Completed: **2/4/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: **See monitoring-well data sheets Plate D.14, E.14 and E.30 for well specifications.**

Continued Next Page

LOG OF BORING NO. MW-19

Project Description: Hawthorn Park #2185 / Sanifill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'07.6"/95°33'31.6" Surface El.: 106.1 ' MSL											
55		•••••	SAND, tan to reddish brown, very fine grained to fine grained, subrounded to rounded, poorly sorted.										7	
60		▨▨▨▨▨	CLAY, reddish brown, very stiff, dry.											
63.0														
65														
70														
75														
80														
85														
90														
95														
100														
Completion Depth: 63.0 Date Boring Started: 2/4/95 Date Boring Completed: 2/4/95 Engineer/Geologist: Stamoulis Project No.: 9502-001				Remarks: See monitoring-well data sheets Plate D.14, E.14 and E.30 for well specifications.										

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. **PLATE B.15**
In situ, the transition may be gradual.

LOG OF BORING NO. MW-20

Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	ROD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'05.8"/95°33'38.7" Surface El.: 107.8' MSL											
5			SANDY CLAY, dark gray, w/rock fragments, brick, gravel and coarse sand (fill).											
			9.5											
10			SANDY CLAY, dark gray, firm, w/clay pockets, w/trace calcareous nodules.											
15			16.0											
20			SAND, light gray, very fine grained, subrounded to rounded, well graded, (moist) - tan below 19.0'.											
			22.0											
25			SANDY CLAY, light brown to tan, stiff.											
30			30.0											
35			SILTY CLAY, reddish brown, stiff w/trace calcareous nodules.											
			36.0											
40			SANDY CLAY, reddish brown, firm.											
			40.0											
45			SAND, tan to light reddish brown, very fine grained to fine grained, subrounded to rounded, well graded.											
50														

Completion Depth: **63.0**
 Date Boring Started: **2/5/95**
 Date Boring Completed: **2/5/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: **See monitoring-well data sheets Plate D.15, E.15 and E.31 for well specifications.**

Continued Next Page

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual. **PLATE B.16**

LOG OF BORING NO. MW-20

Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'05.8"/95°33'38.7" Surface El.: 107.8' MSL											
-55			SAND, tan to reddish brown, very fine grained to fine grained, subrounded to rounded, well graded.										14	
-60														
			62.0											
			CLAY, reddish brown, hard, dry.											
			63.0											
-65														
-70														
-75														
-80														
-85														
-90														
-95														
-100														
Completion Depth: 63.0 Date Boring Started: 2/5/95 Date Boring Completed: 2/5/95 Engineer/Geologist: Stamoulis Project No.: 9502-001				Remarks: See monitoring-well data sheets Plate D.15, E.15 and E.31 for well specifications.										

Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. **PLATE B.16**
Insitu, the transition may be gradual.

LOG OF BORING NO. MW-21

Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	ROD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'15.7"/95°33'42.4" Surface El.: 104.5' MSL											
		3.0	SANDY CLAY, dark gray, firm w/organics (moist), w/calcareous nodules (fill).											
5		8.0	SANDY CLAY, gray, soft, w/calcareous nodules (fill).											
10			SANDY CLAY, light brown to tan, firm. - stiff, w/calcareous nodules and ferrous stains below 12.0'.											
15														
20														
25		23.0	SILTY CLAY, light brown to tan, w/calcareous nodules (moist).											
30		27.0	SAND, light gray, very fine grained to fine grained, slightly silty, subrounded to rounded, well graded.											
35														
40														
45														
50														

Completion Depth: **70.0**
 Date Boring Started: **2/6/95**
 Date Boring Completed: **2/6/95**
 Engineer/Geologist: **Stamoulis**
 Project No.: **9502-001**

Remarks: **See monitoring-well data sheets Plate D.16, E.16 and E.32 for well specifications.**

Continued Next Page

LOG OF BORING NO. MW-21

Project Description: Hawthorn Park #2185 / Sanfill of Texas, Inc.
Harris County, Texas



Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Pocket Penetro- meter, TSF	Penetration Blows / Foot	Recovery %	ROD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			Location: 29°51'15.7"/95°33'42.4" Surface El.: 104.5' MSL											
55		•••••	SAND, tan to light brown, very fine grained to fine grained, subrounded to rounded, well graded.										7	
60		•••••												
65		•••••												
68.0		•••••												
70		•••••	CLAY, reddish brown, hard, dry.											
70.0		•••••												
75		•••••												
80		•••••												
85		•••••												
90		•••••												
95		•••••												
100		•••••												

Completion Depth: 70.0 Date Boring Started: 2/6/95 Date Boring Completed: 2/6/95 Engineer/Geologist: Stamoulis Project No.: 9502-001	Remarks: See monitoring-well data sheets Plate D.16, E.16 and E.32 for well specifications.
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Hydrogeologic/Engineering of Texas The stratification lines represent approximate strata boundaries. **PLATE B.17**
In situ, the transition may be gradual.

MONITORING WELL DATA SHEETS

A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park

County: Harris County, Texas

Date of Monitor Well Installation: 2/3/95

Monitor Well: Latitude: 29°51'23.9" Longitude: 95°33'41.7"

Monitor Well Groundwater

Gradient: Upgradient Downgradient

MSW PERMIT NO. #2185

Monitor Well I.D. No.: MW-6

Date of Monitor Well

Development: 2/19/95

Monitor Well Driller

Name: T. E. Mathers

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoullis

Static Water Level Elevation (with respect to MSL) after Well Development: 94.40'

Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 104.50'

Top of Protective Collar Elevation: 108.19'

Top of Casing Elevation: 107.80'

Surveyor's Pin Elevation: 104.87'

Concrete Seal

Depth: 1.5'

Casing Seal (Backfill)

Material: Volclay Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads

Bentonite Seal Top

Depth: 36.9' Elevation: 67.60'

Filter Pack Top

Depth: 40.0' Elevation: 64.50'

Well Screen

Top Depth: 48.0'

Top Elevation: 56.50'

Type of Well Screen: Circumslot

Screen Opening Size:

0.010

Well Casing

Type: PVC

Size (diameter): 2"

Schedule or Thickness: 40

Bottom Cap (Depth: 58.5')

Bore Hole Diameter: 7 5/8"

PLATE E.1

III-4B-284

A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park
County: Harris County, Texas
Date of Monitor Well Installation: 2/7/95
Monitor Well: Latitude: 29°51'27.7" Longitude: 95°33'26.5"
Monitor Well Groundwater
Gradient: Upgradient Downgradient

MSW PERMIT NO. #2185
Monitor Well I.D. No.: MW-7
Date of Monitor Well
Development: 2/22/95
Monitor Well Driller
Name: T. E. Mathers
License No.: 3096W

NOTE:

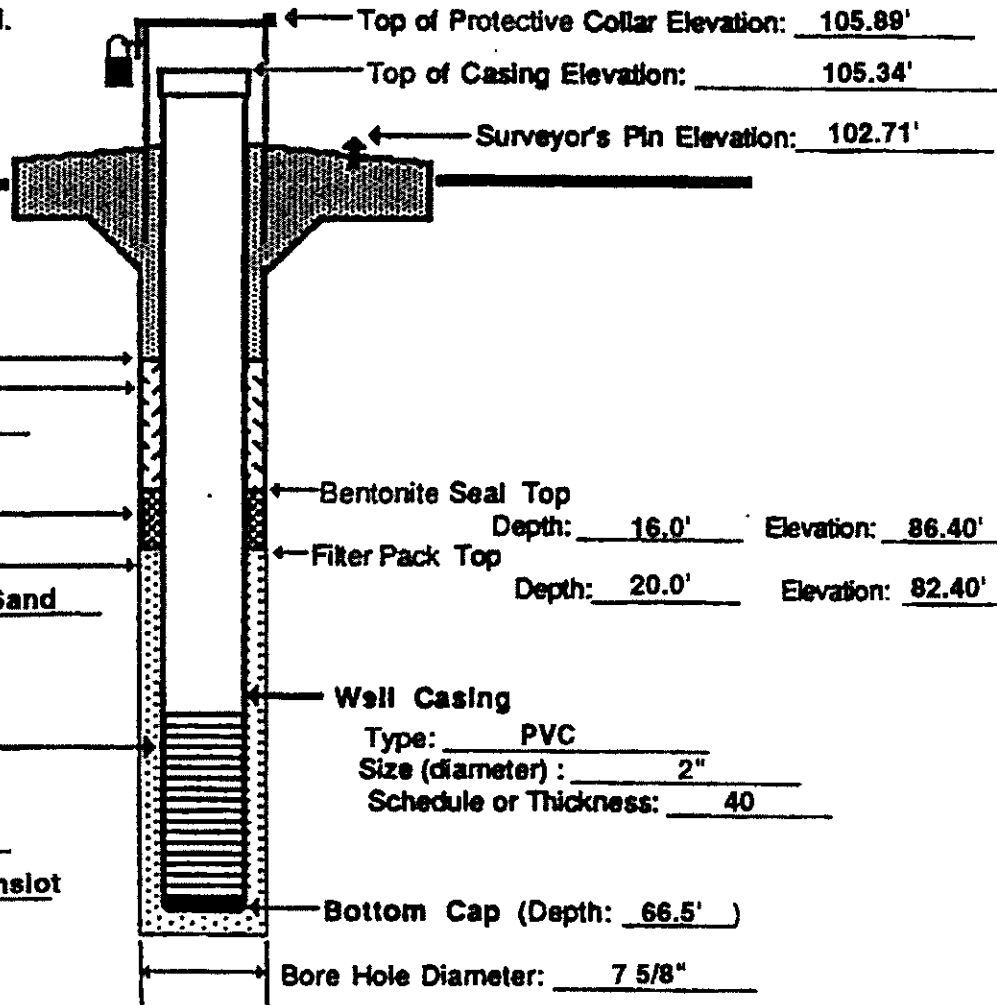
- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoullis
Static Water Level Elevation (with respect to MSL) after Well Development: 92.77'
Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.
Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 102.40'



Concrete Seal
Depth: 1.0'
Casing Seal (Backfill)
Material: Volclay Grout

Bentonite Seal
Filter Pack
Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads

Well Screen
Top Depth: 56.0'
Top Elevation: 46.40'
Type of Well Screen: Circumslot
Screen Opening Size: 0.010

Top of Protective Collar Elevation: 105.89'
Top of Casing Elevation: 105.34'
Surveyor's Pin Elevation: 102.71'
Bentonite Seal Top
Depth: 16.0' Elevation: 86.40'
Filter Pack Top
Depth: 20.0' Elevation: 82.40'
Well Casing
Type: PVC
Size (diameter) : 2"
Schedule or Thickness: 40
Bottom Cap (Depth: 66.5')
Bore Hole Diameter: 7 5/8"

A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanfill of Texas, Inc.
Hawthorn Park

County: Harris County, Texas

Data of Monitor Well Installation: 2/7/95

Monitor Well: Latitude: 29°51'27.6" Longitude: 95°33'20.2"

Monitor Well Groundwater

Gradient: Upgradient Downgradient

MSW PERMIT NO. #2185

Monitor Well I.D. No.: MW-8

Date of Monitor Well

Development: 2/22/95

Monitor Well Driller

Name: T. E. Mathers

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulis

Static Water Level Elevation (with respect to MSL) after Well Development: 91.34'

Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 102.20'

Top of Protective Collar Elevation: 105.81'

Top of Casing Elevation: 105.29'

Surveyor's Pin Elevation: 102.64'

Concrete Seal
Depth: 1.0'

Casing Seal (Backfill)
Material: Volclay Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads

Bentonite Seal Top
Depth: 21.0' Elevation: 80.20'

Filter Pack Top
Depth: 24.0' Elevation: 78.20'

Well Screen
Top Depth: 53.0'

Top Elevation: 49.20'

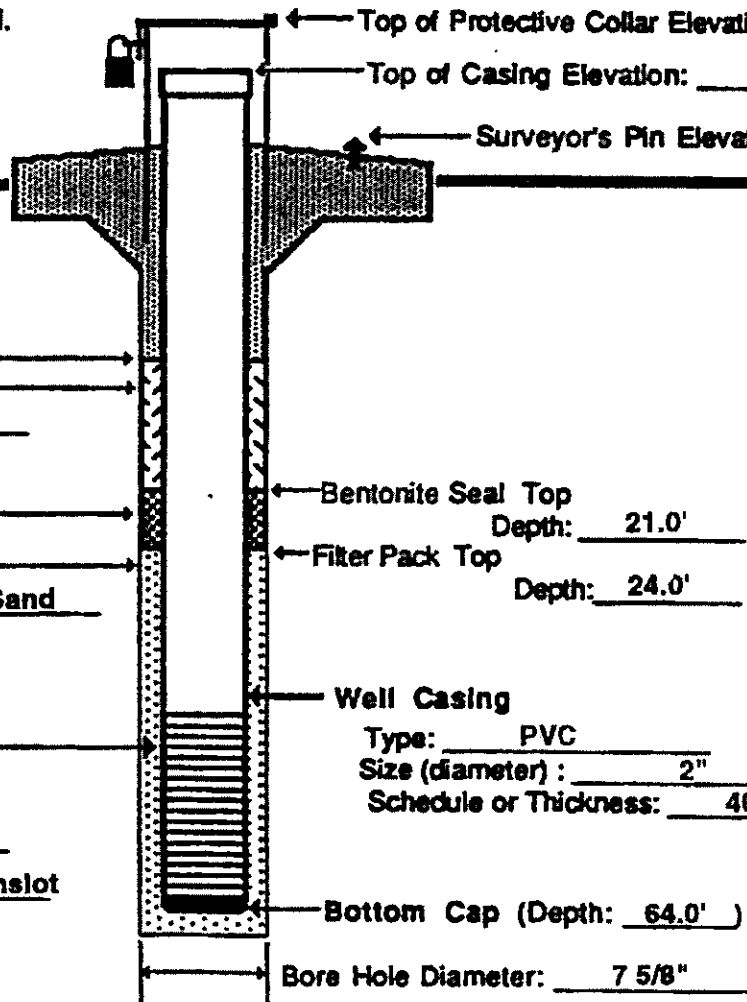
Type of Well Screen: Circumslot

Screen Opening Size:
0.010

Well Casing
Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40

Bottom Cap (Depth: 64.0')

Bore Hole Diameter: 7 5/8"



A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park

County: Harris County, Texas

Date of Monitor Well Installation: 2/23/95

Monitor Well: Latitude: 29°51'21.9" Longitude: 95°33'12.2"

Monitor Well Groundwater

Gradient: Upgradient Downgradient

MSW PERMIT NO. #2185

Monitor Well I.D. No.: MW-9

Date of Monitor Well

Development: 2/27/95

Monitor Well Driller

Name: T. E. Mathers

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulls

Static Water Level Elevation (with respect to MSL) after Well Development: 88.20'

Name of Geologic Formation(s) in which Well is completed: Lissie

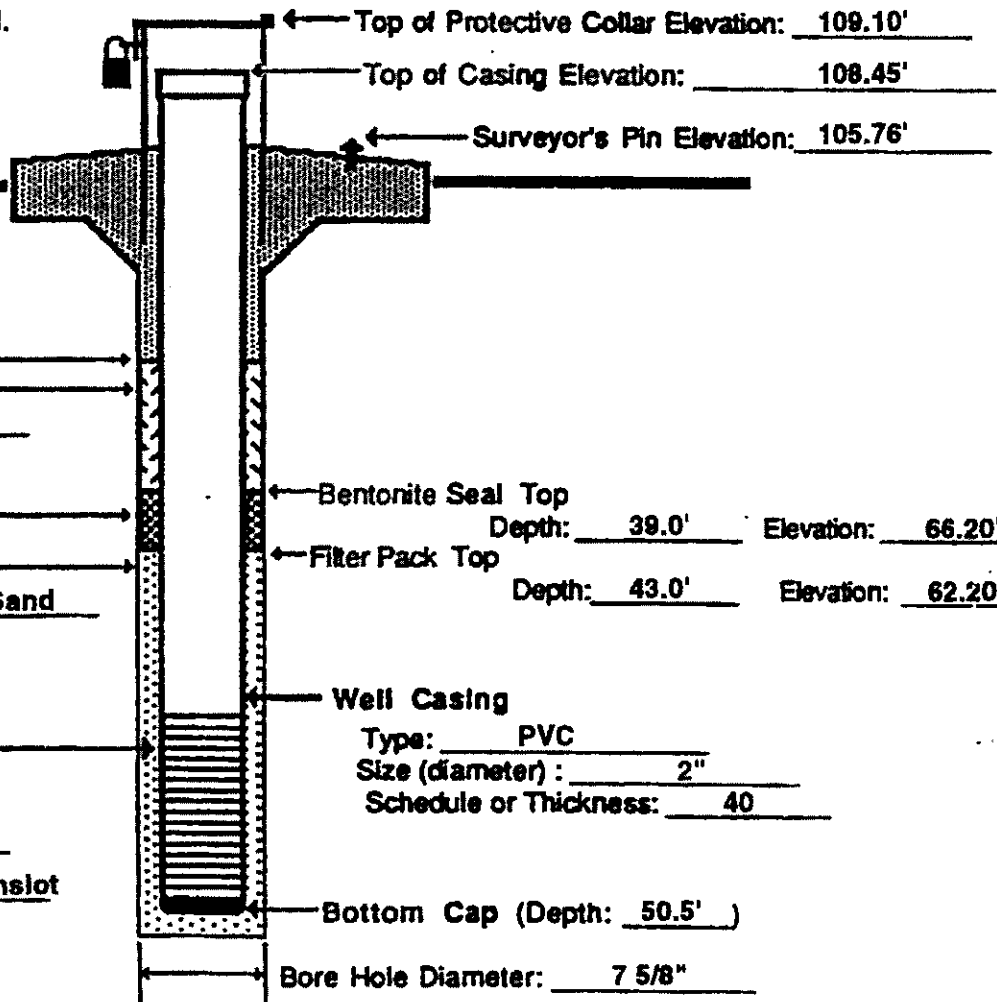
Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 105.20'



Top of Protective Collar Elevation: 109.10'

Top of Casing Elevation: 108.45'

Surveyor's Pin Elevation: 105.76'

Concrete Seal
Depth: 1.5'

Casing Seal (Backfill)
Material: Volclay Grout

Bentonite Seal
Depth: 39.0' Elevation: 66.20'

Filter Pack
Depth: 43.0' Elevation: 62.20'

Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads

Well Screen
Top Depth: 45.0'
Top Elevation: 60.20'

Type of Well Screen: Circumslot

Screen Opening Size:
0.010

Well Casing
Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40

Bottom Cap (Depth: 50.5')

Bore Hole Diameter: 7 5/8"

A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park

MSW PERMIT NO. #2185

County: Harris County, Texas

Monitor Well I.D. No.: MW-10

Data of Monitor Well Installation: 2/17/95

Date of Monitor Well Development: 2/23/95

Monitor Well: Latitude: 29°51'28.0" Longitude: 95°33'11.6"

Monitor Well Driller Name: T. E. Mathers

Monitor Well Groundwater Gradient: Upgradient Downgradient

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulis

Static Water Level Elevation (with respect to MSL) after Well Development: 93.55'

Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 102.20'

Top of Protective Collar Elevation: 105.72'

Top of Casing Elevation: 105.20'

Surveyor's Pin Elevation: 102.57'

Concrete Seal Depth: 1.5'

Casing Seal (Backfill) Material: Volclay Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 20-40 Sand Sterilized (Sand or Glass Beads)

Bentonite Seal Top Depth: 36.0' Elevation: 66.20'

Filter Pack Top Depth: 39.0' Elevation: 63.20'

Well Screen Top Depth: 41.0'

Top Elevation: 61.20'

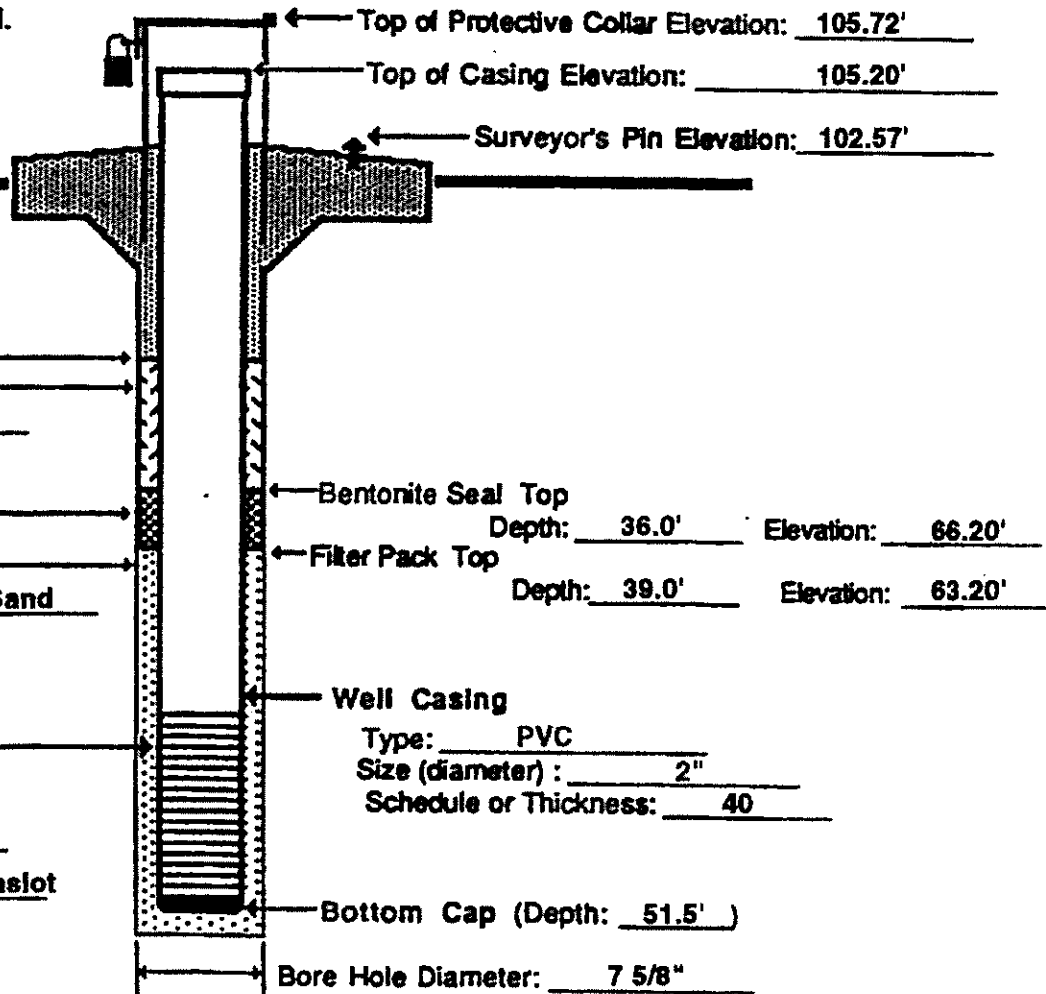
Type of Well Screen: Circumslot

Screen Opening Size: 0.010

Well Casing Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40

Bottom Cap (Depth: 51.5')

Bore Hole Diameter: 7 5/8"



A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park

County: Harris County, Texas

Date of Monitor Well Installation: 2/17/95

Monitor Well: Latitude: 29°51'21.8" Longitude: 95°32'56.3"

Monitor Well Groundwater

Gradient: Upgradient Downgradient

MSW PERMIT NO. #2185

Monitor Well I.D. No.: MW-11

Date of Monitor Well

Development: 2/23/95

Monitor Well Driller

Name: T. E. Mathers

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulis

Static Water Level Elevation (with respect to MSL) after Well Development: 93.21'

Name of Geologic Formation(s) in which Well is completed: Lissie

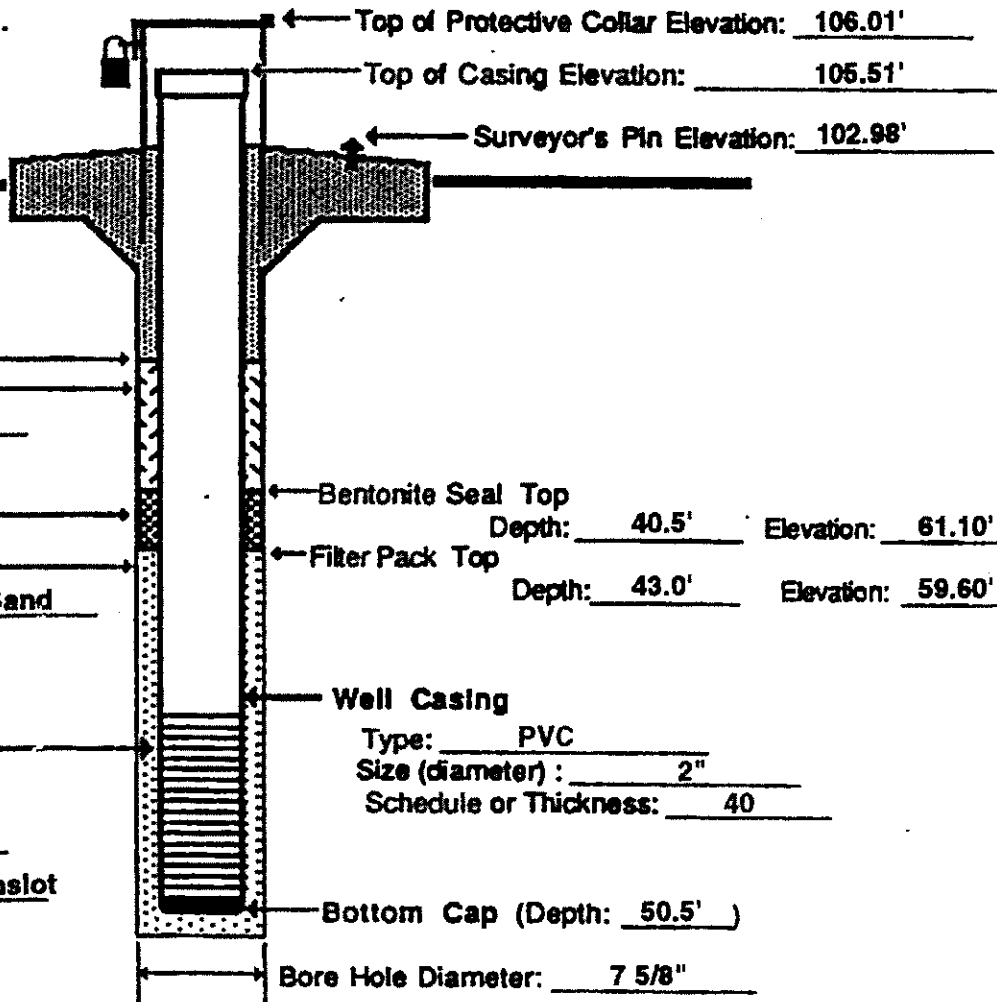
Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 102.60'



Top of Protective Collar Elevation: 106.01'

Top of Casing Elevation: 105.51'

Surveyor's Pin Elevation: 102.98'

Concrete Seal
Depth: 1.0'
Casing Seal (Backfill)
Material: Volclay Grout

Bentonite Seal
Filter Pack
Bentonite Seal Top
Depth: 40.5' Elevation: 61.10'

Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads
Filter Pack Top
Depth: 43.0' Elevation: 59.60'

Well Casing
Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40

Well Screen
Top Depth: 45.0'
Top Elevation: 57.60'
Type of Well Screen: Circumslot
Screen Opening Size:
0.010
Bottom Cap (Depth: 50.5')

Bore Hole Diameter: 7 5/8"

A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park

County: Harris County, Texas

Date of Monitor Well Installation: 2/15/95

Monitor Well: Latitude: 29°51'11.2" Longitude: 95°32'55.8"

Monitor Well Groundwater

Gradient: Upgradient _____ Downgradient

MSW PERMIT NO. #2185

Monitor Well I.D. No.: MW-12

Date of Monitor Well

Development: 2/23/95

Monitor Well Driller

Name: T. E. Mathers

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoullis

Static Water Level Elevation (with respect to MSL) after Well Development: 94.44'

Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 102.40'

Top of Protective Collar Elevation: 105.71'

Top of Casing Elevation: 105.10'

Surveyor's Pin Elevation: 102.68'

Concrete Seal

Depth: 1.5'

Casing Seal (Backfill)

Material: Volclay Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 20-40 Sand

Sterilized Sand or Glass Beads

Bentonite Seal Top

Depth: 10.3'

Elevation: 92.10'

Filter Pack Top

Depth: 14.0'

Elevation: 88.40'

Well Casing

Type: PVC

Size (diameter) : 2"

Schedule or Thickness: 40

Well Screen

Top Depth: 40.0'

Top Elevation: 62.40'

Type of Well Screen: Circumslot

Screen Opening Size:

0.010

Bottom Cap (Depth: 50.5')

Bore Hole Diameter: 7 5/8"

A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park

MSW PERMIT NO. #2185

County: Harris County, Texas

Monitor Well I.D. No.: MW-13

Data of Monitor Well Installation: 2/15/95

Date of Monitor Well Development: 2/23/95

Monitor Well: Latitude: 29°51'00.5" Longitude: 95°32'56.3"

Monitor Well Driller Name: T. E. Mathers

Monitor Well Groundwater Gradient: Upgradient Downgradient

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulis

Static Water Level Elevation (with respect to MSL) after Well Development: 91.32'

Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 102.10'

Top of Protective Collar Elevation: 105.70'

Top of Casing Elevation: 105.14'

Surveyor's Pin Elevation: 102.48'

Concrete Seal Depth: 1.5'
Casing Seal (Backfill) Material: Volclay Grout

Bentonite Seal
Filter Pack

Bentonite Seal Top Depth: 11.0' Elevation: 91.10'

Filter Pack Top Depth: 14.0' Elevation: 88.10'

Filter Pack Material: 20-40 Sand Sterilized Sand or Glass Beads

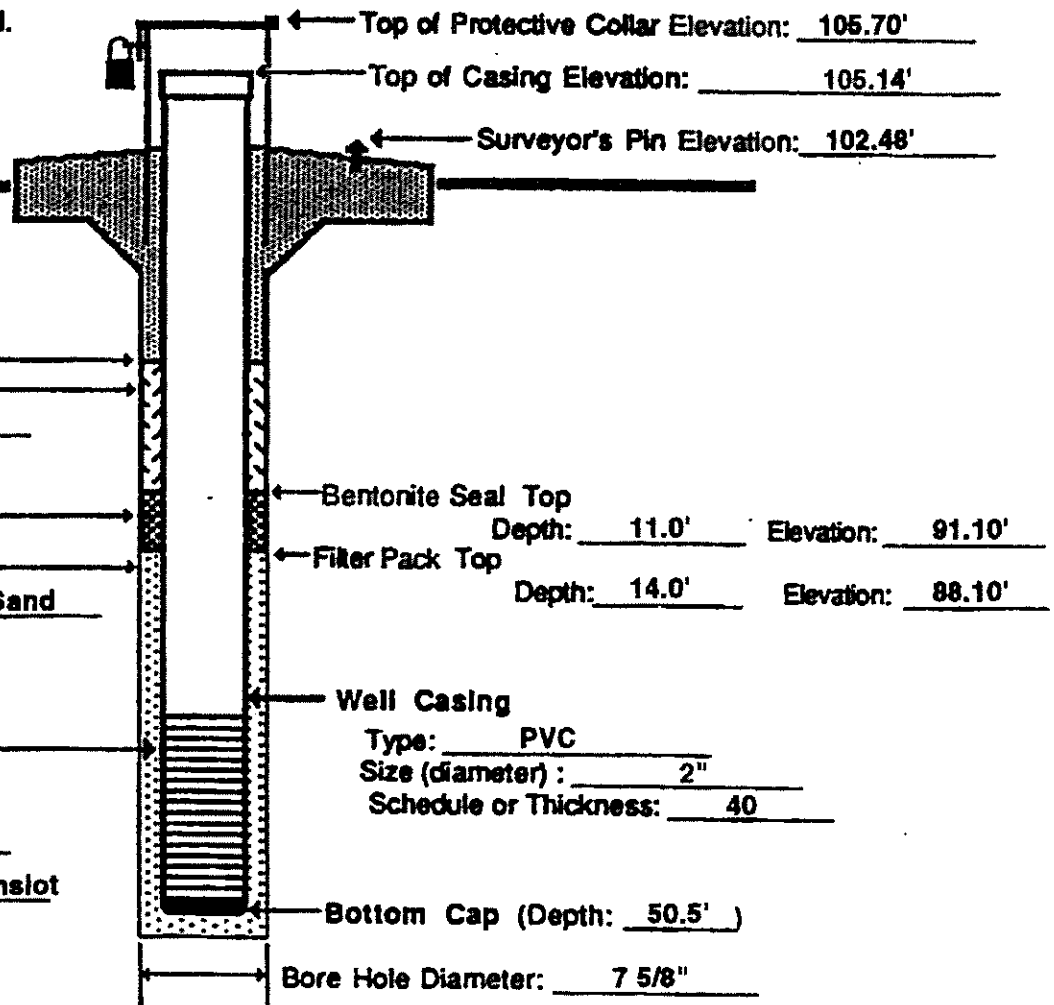
Well Screen Top Depth: 40.0'
Top Elevation: 62.10'

Well Casing Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40

Type of Well Screen: Circumslot
Screen Opening Size: 0.010

Bottom Cap (Depth: 50.5')

Bore Hole Diameter: 7 5/8"



A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park

County: Harris County, Texas

Date of Monitor Well Installation: 2/14/95

Monitor Well: Latitude: 29°51'10.8" Longitude: 95°33'12.1"

Monitor Well Groundwater

Gradient: Upgradient _____ Downgradient

MSW PERMIT NO. #2185

Monitor Well I.D. No.: MW-14

Date of Monitor Well

Development: 2/27/95

Monitor Well Driller

Name: T. E. Mathers

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulis

Static Water Level Elevation (with respect to MSL) after Well Development: 85.98'

Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 103.50'

Top of Protective Collar Elevation: 106.98'

Top of Casing Elevation: 106.43'

Surveyor's Pin Elevation: 103.83'

Concrete Seal

Depth: 1.5'

Casing Seal (Backfill)

Material: Volclay Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 20-40 Sand

Sterilized Sand or Glass Beads

Bentonite Seal Top
Depth: 43.1' Elevation: 60.40'

Filter Pack Top
Depth: 46.0' Elevation: 57.50'

Well Casing

Type: PVC

Size (diameter): 2"

Schedule or Thickness: 40

Well Screen

Top Depth: 48.0'

Top Elevation: 55.50'

Type of Well Screen: Circumslot

Screen Opening Size:

0.010

Bottom Cap (Depth: 58.5')

Bore Hole Diameter: 7 5/8"

A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park

County: Harris County, Texas

Data of Monitor Well Installation: 2/15/95

Monitor Well: Latitude: 29°51'00.8" Longitude: 95°33'12.1"

Monitor Well Groundwater

Gradient: Upgradient Downgradient

MSW PERMIT NO. #2185

Monitor Well I.D. No.: MW-15

Date of Monitor Well

Development: 2/20/95

Monitor Well Driller

Name: T. E. Mathers

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulis

Static Water Level Elevation (with respect to MSL) after Well Development: 87.76'

Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 104.00'

Top of Protective Collar Elevation: 107.49'

Top of Casing Elevation: 106.76'

Surveyor's Pin Elevation: 104.20'

Concrete Seal
Depth: 1.0'
Casing Seal (Backfill)
Material: Volclay Grout

Bentonite Seal
Filter Pack

Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads

Bentonite Seal Top
Depth: 30.0' Elevation: 74.00'

Filter Pack Top
Depth: 33.0' Elevation: 71.00'

Well Screen
Top Depth: 53.0'
Top Elevation: 51.00'
Type of Well Screen: Circumslot
Screen Opening Size: 0.010

Well Casing
Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40

Bottom Cap (Depth: 63.5')

Bore Hole Diameter: 7 5/8"

A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanfill of Texas, Inc.
Hawthorn Park
County: Harris County, Texas
Date of Monitor Well Installation: 2/14/95
Monitor Well: Latitude: 29°51'00.5" Longitude: 95°33'15.3"
Monitor Well Groundwater
Gradient: Upgradient Downgradient

MSW PERMIT NO. #2185
Monitor Well I.D. No.: MW-16
Date of Monitor Well
Development: 2/20/95
Monitor Well Driller
Name: T. E. Mathers
License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulis
Static Water Level Elevation (with respect to MSL) after Well Development: 87.36'
Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.
Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 103.10'

Top of Protective Collar Elevation: 106.82'
Top of Casing Elevation: 106.26'
Surveyor's Pin Elevation: 103.47'

Concrete Seal
Depth: 1.0'
Casing Seal (Backfill)
Material: Volclay Grout

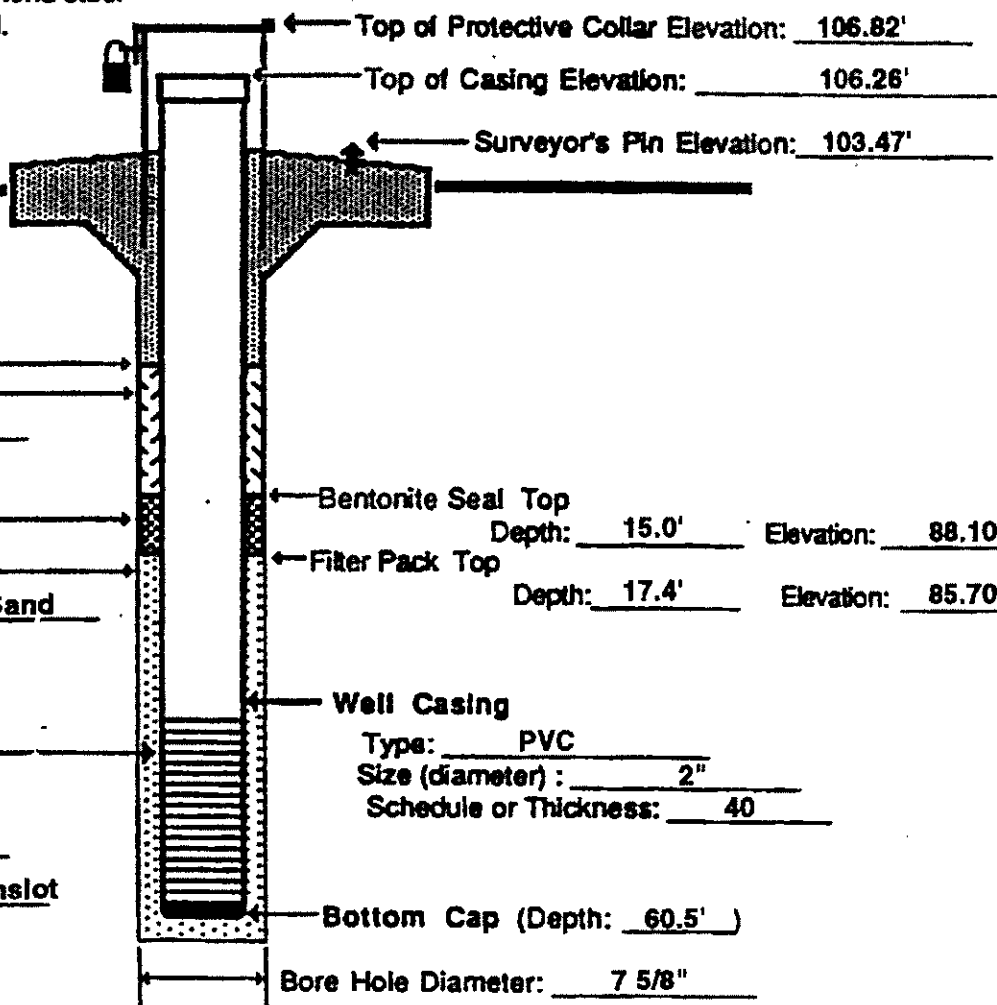
Bentonite Seal
Filter Pack
Bentonite Seal Top
Depth: 15.0' Elevation: 88.10'

Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads
Filter Pack Top
Depth: 17.4' Elevation: 85.70'

Well Casing
Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40

Well Screen
Top Depth: 50.0'
Top Elevation: 53.10'
Type of Well Screen: Circumslot
Bottom Cap (Depth: 60.5')

Screen Opening Size: 0.010
Bore Hole Diameter: 7 5/8"



A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park
County: Harris County, Texas
Date of Monitor Well Installation: 2/13/95
Monitor Well: Latitude: 29°51'06.6" Longitude: 95°33'21.1"
Monitor Well Groundwater
Gradient: Upgradient Downgradient

MSW PERMIT NO. #2185
Monitor Well I.D. No.: MW-17
Date of Monitor Well
Development: 2/20/95
Monitor Well Driller
Name: T. E. Mathers
License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulis
Static Water Level Elevation (with respect to MSL) after Well Development: 84.03'
Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.
Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 103.00'

Top of Protective Collar Elevation: 106.32'
Top of Casing Elevation: 105.83'
Surveyor's Pin Elevation: 103.15'

Concrete Seal
Depth: 1.0'
Casing Seal (Backfill)
Material: Volclay Grout

Bentonite Seal
Filter Pack

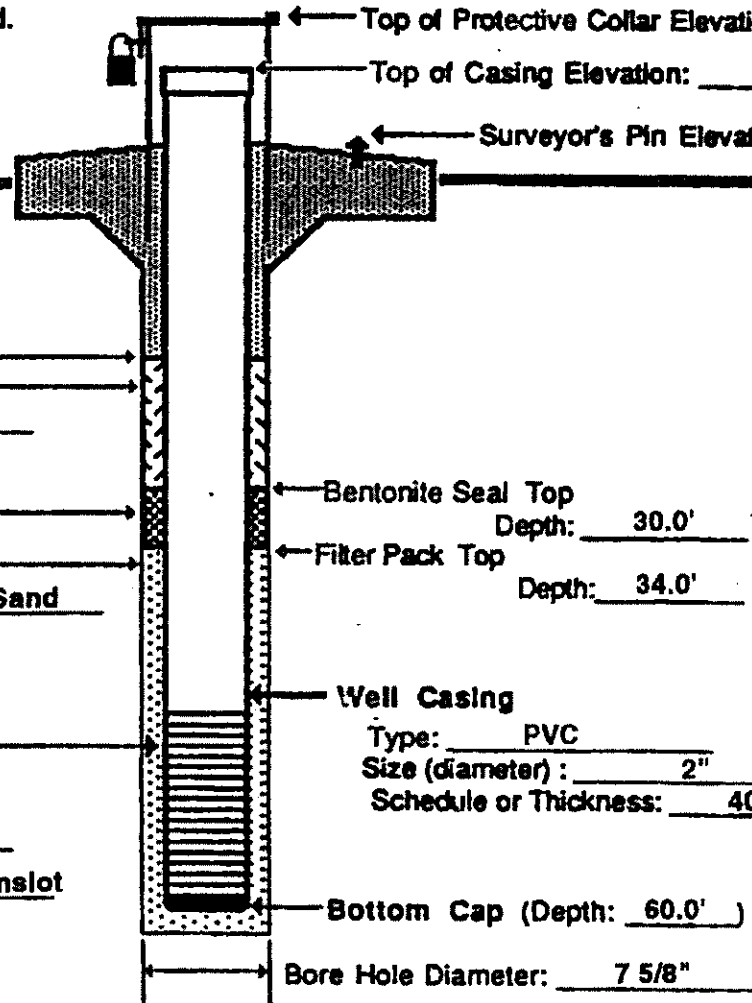
Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads

Bentonite Seal Top
Depth: 30.0' Elevation: 73.00'
Filter Pack Top
Depth: 34.0' Elevation: 69.00'

Well Screen
Top Depth: 49.5'
Top Elevation: 53.50'
Type of Well Screen: Circumslot
Screen Opening Size: 0.010

Well Casing
Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40

Bottom Cap (Depth: 60.0')
Bore Hole Diameter: 7 5/8"



A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park

County: Harris County, Texas

Date of Monitor Well Installation: 2/6/95

Monitor Well: Latitude: 29°51'10.3" Longitude: 95°33'26.7"

Monitor Well Groundwater

Gradient: Upgradient Downgradient

MSW PERMIT NO. #2185

Monitor Well I.D. No.: MW-18

Date of Monitor Well

Development: 2/20/95

Monitor Well Driller

Name: T. E. Mathers

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulis

Static Water Level Elevation (with respect to MSL) after Well Development: 87.09'

Name of Geologic Formation(s) in which Well is completed: Lissie

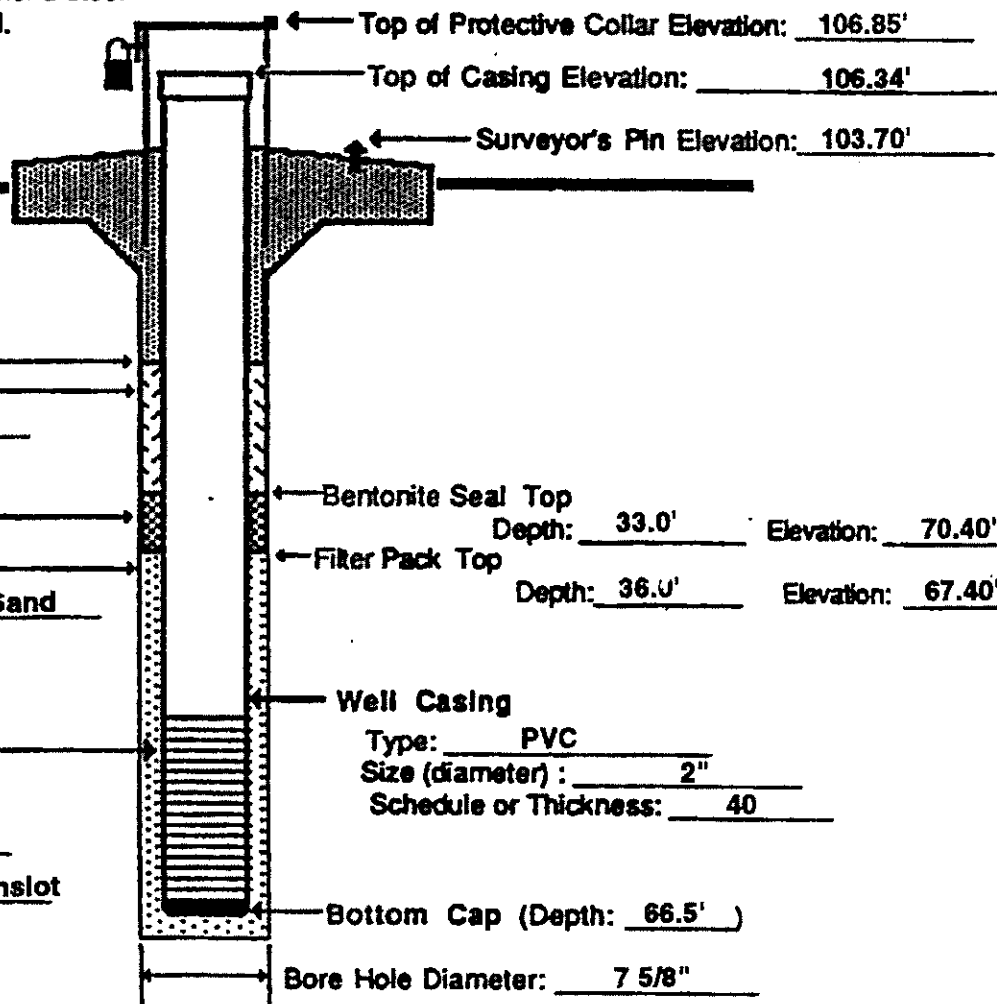
Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 103.40'



Concrete Seal
Depth: 1.0'
Casing Seal (Backfill)
Material: Volclay Grout

Bentonite Seal
Filter Pack
Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads

Well Screen
Top Depth: 46.0'
Top Elevation: 57.40'
Type of Well Screen: Circumslot
Screen Opening Size: 0.010

Top of Protective Collar Elevation: 106.85'
Top of Casing Elevation: 106.34'
Surveyor's Pin Elevation: 103.70'
Bentonite Seal Top
Depth: 33.0' Elevation: 70.40'
Filter Pack Top
Depth: 36.0' Elevation: 67.40'
Well Casing
Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40
Bottom Cap (Depth: 66.5')
Bore Hole Diameter: 7 5/8"

A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SE67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park

County: Harris County, Texas

Date of Monitor Well Installation: 2/4/95

Monitor Well: Latitude: 29°51'07.6" Longitude: 95°33'31.6"

Monitor Well Groundwater

Gradient: Upgradient _____ Downgradient

MSW PERMIT NO. #2185

Monitor Well I.D. No.: MW-19

Date of Monitor Well _____

Development: 2/19/95

Monitor Well Driller

Name: T. E. Mathers

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulis

Static Water Level Elevation (with respect to MSL) after Well Development: 88.42'

Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 106.10'

Top of Protective Collar Elevation: 109.62'

Top of Casing Elevation: 109.07'

Surveyor's Pin Elevation: 106.51'

Concrete Seal Depth: 1.0'

Casing Seal (Backfill) Material: Volclay Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads

Bentonite Seal Top Depth: 39.0' Elevation: 67.10'

Filter Pack Top Depth: 42.0' Elevation: 64.10'

Well Screen Top Depth: 48.0'

Top Elevation: 58.10'

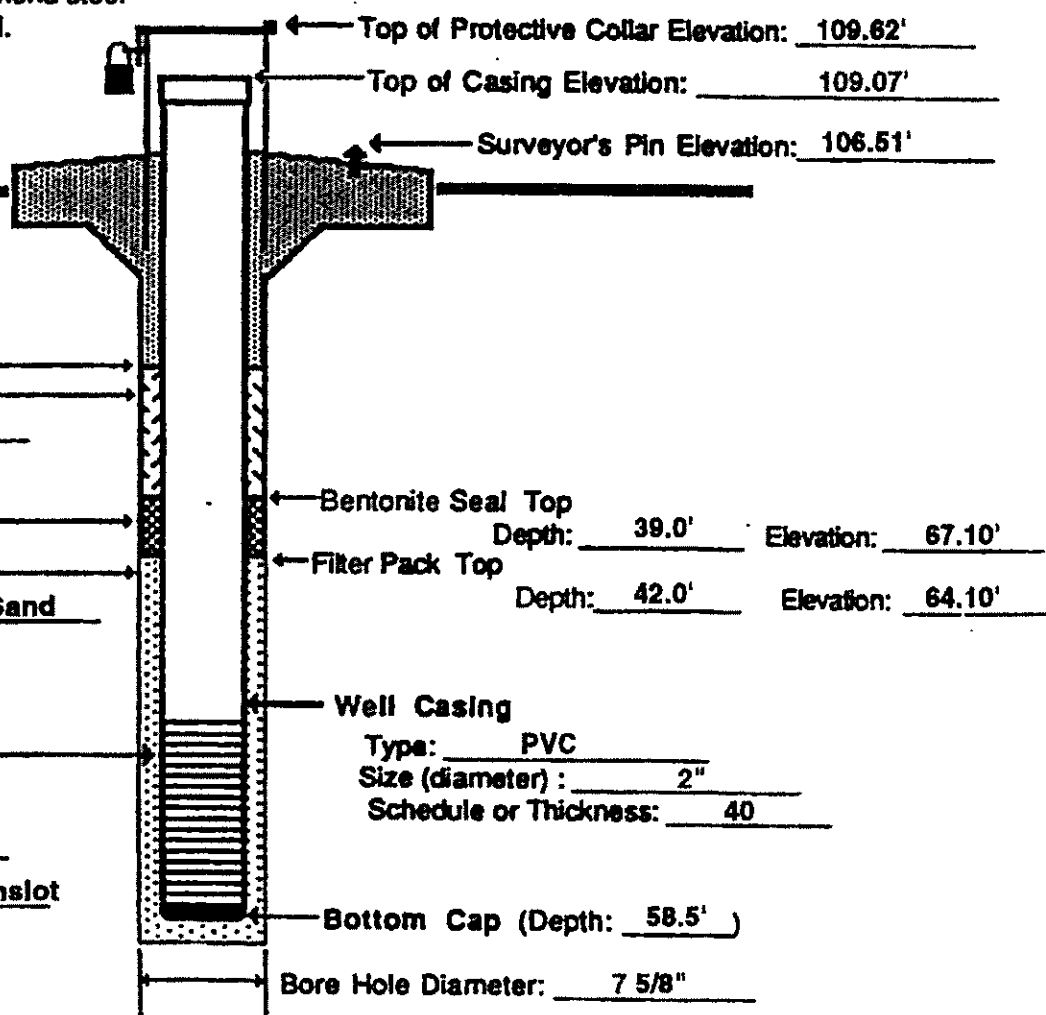
Type of Well Screen: Circumslot

Screen Opening Size: 0.010

Well Casing Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40

Bottom Cap (Depth: 58.5')

Bore Hole Diameter: 7 5/8"



A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SB67

Permittee or Site Name: Sanifill of Texas, Inc.
Hawthorn Park

County: Harris County, Texas

Date of Monitor Well Installation: 2/5/95

Monitor Well: Latitude: 29°51'05.8" Longitude: 95°33'38.7"

Monitor Well Groundwater
Gradient: Upgradient Downgradient

MSW PERMIT NO. #2185

Monitor Well I.D. No.: MW-20

Date of Monitor Well

Development: 2/18/95

Monitor Well Driller

Name: T. E. Mathers

License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoullis

Static Water Level Elevation (with respect to MSL) after Well Development: 91.89'

Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock

Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 6' x 12' x 8"

Surface Elevation: 107.80'

Top of Protective Collar Elevation: 111.06'

Top of Casing Elevation: 110.69'

Surveyor's Pin Elevation: —

Concrete Seal
Depth: 1.5'
Casing Seal (Backfill)
Material: Volclay Grout

Bentonite Seal
Filter Pack

Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads

Bentonite Seal Top
Depth: 37.0' Elevation: 70.80'

Filter Pack Top
Depth: 40.0' Elevation: 67.80'

Well Screen
Top Depth: 48.0'
Top Elevation: 59.80'

Type of Well Screen: Circumslot

Screen Opening Size: 0.010

Well Casing
Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40

Bottom Cap (Depth: 48.5')

Bore Hole Diameter: 7 5/8"

A. Monitor Well Data Sheet

TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
MSWD-SB67

Permittee or Site Name: Sanfill of Texas, Inc.
Hawthorn Park
County: Harris County, Texas
Date of Monitor Well Installation: 2/6/95
Monitor Well: Latitude: 29°51'15.7" Longitude: 95°33'42.4"
Monitor Well Groundwater
Gradient: Upgradient Downgradient

MSW PERMIT NO. #2185
Monitor Well I.D. No.: MW-21
Date of Monitor Well Development: 2/18/95
Monitor Well Driller Name: T. E. Mathers
License No.: 3096W

NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Seal Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Stamoulis
Static Water Level Elevation (with respect to MSL) after Well Development: 92.93'
Name of Geologic Formation(s) in which Well is completed: Lissie

Type of Locking Device: Padlock Type of Casing Protection: Aluminum/Post

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.
Surface Pad Dimensions: 3' x 3' x 4"

Surface Elevation: 105.07'

Top of Protective Collar Elevation: 108.35'
Top of Casing Elevation: 107.94'
Surveyor's Pin Elevation: 104.50'

Concrete Seal
Depth: 1.0'
Casing Seal (Backfill)
Material: Volclay Grout

Bentonite Seal
Filter Pack

Bentonite Seal Top
Depth: 22.3' Elevation: 82.20'
Filter Pack Top
Depth: 26.0' Elevation: 78.50'

Filter Pack Material: 20-40 Sand
Sterilized Sand or Glass Beads

Well Screen
Top Depth: 55.0'
Top Elevation: 49.50'
Type of Well Screen: Circumslot
Screen Opening Size: 0.010

Well Casing
Type: PVC
Size (diameter): 2"
Schedule or Thickness: 40

Bottom Cap (Depth: 65.5')

Bore Hole Diameter: 7 5/8"

PLUGGING REPORTS

A. Well Identification and Location Data

- 1) Owner: Sanifill of Texas Inc., Address: West Belt Houston, Tx
 (Name) (Street or RFD) (City) (State) (Zip)
- 2) Owner's Well Number: MW-1
- 3) Location of Well: County Harris, 16 miles in West direction from Houston
 (N.E., S.W., etc.) (Town)

Driller or other person performing the plugging operations must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

- Legal description:
 Section No. _____ Block No. _____ Township _____
 Abstract No. _____ Survey Name _____
 Distance and direction from two intersecting section lines or survey lines: _____
- See Attached map.

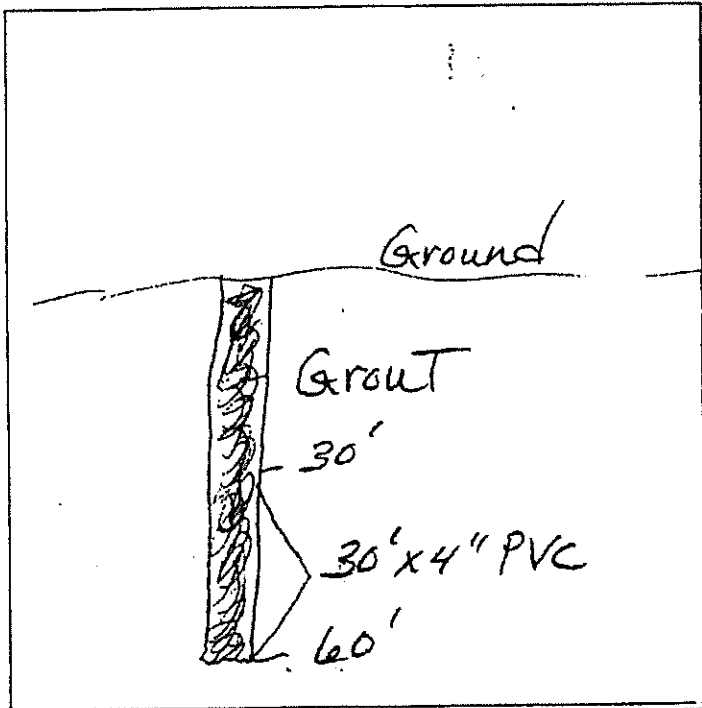
B. Historical Data on Well To Be Plugged (if available)

- 4) Driller: N/A License Number: N/A City: N/A
- 5) Drilled: N/A 19 N/A 6) Diameter of hole: N/A inches; 7) Total depth of well: 60 feet.

C. Current Plugging Data

- 8) Date well plugged: 3/11, 19 95.
- 9) Sketch of well: Using space at right, show method of plugging the well including all casing and cemented intervals.
- 10) Name of Driller or other person actually performing the plugging operations: THOMAS E. MATHERS
 if a water well driller plugged the well, give the driller's license no.: 3096 W
- 11) Casing and cementing data relative to the plugging operations:

Diameter (inches)	Casing Left in Well	
	From (feet)	To (feet)
<u>4</u>	<u>60</u>	<u>30</u>
Cement Plug(s) Placed in Well		Sack(s) of cement used
From (feet)	To (feet)	
<u>60</u>	<u>0</u>	<u>15</u>



D. Validation of Information Included in Form

I hereby certify that this well was plugged by me (or under my supervision) and that all of the statements herein are true and accurate to the best of my knowledge and belief.

- Company or Individual's Name: Mathers Environmental Drilling
- Address: 2333-A Wirtcrest Ln. (Type or Print) Houston, Tx 77055
 (Street or RFD) (City) (State) (Zip)
- (Signed) Thomas E. Mathers (Signed) _____
 (Person performing plugging operations) (Owner of Well)

For TNRCC use only

WELL NO. _____

LOCATION ON MAP _____

A. Well Identification and Location Data

1) Owner Sani-fill of Texas, Inc Address West Belt, Houston, TX
 (Name) (Street or RFD) (City) (State) (Zip)
 2) Owner's Well Number MW-2
 3) Location of Well: County Harris 16 miles in West direction from Houston
 (N.E., S.W., etc.) (Town)

Driller or other person performing the plugging operations must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

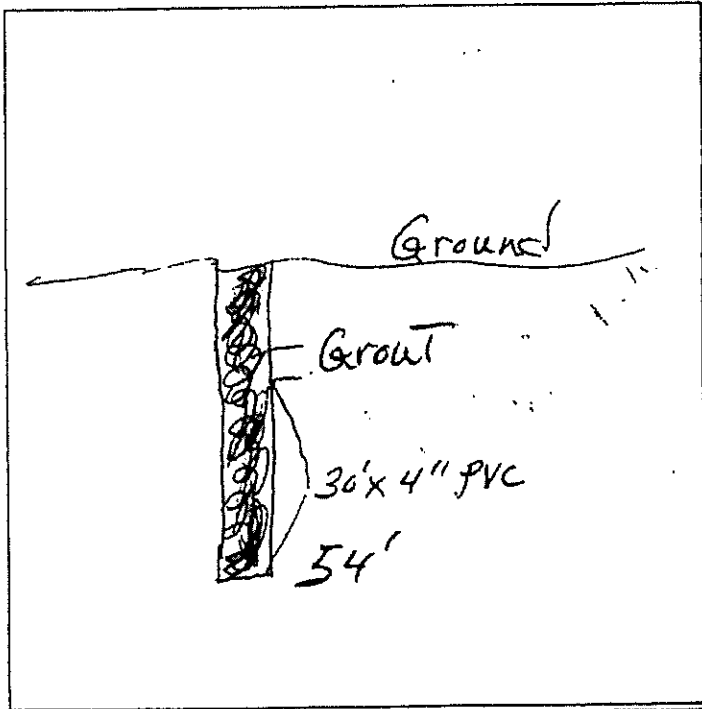
Legal description:
 Section No. _____ Block No. _____ Township _____
 Abstract No. _____ Survey Name _____
 Distance and direction from two intersecting section lines or survey lines: _____
 See Attached map.

B. Historical Data on Well To Be Plugged (if available)

4) Driller N/A License Number N/A City N/A
 5) Drilled N/A 19 N/A Diameter of hole N/A inches; 7) Total depth of well 54 feet.

C. Current Plugging Data

8) Date well plugged 3/11, 19 95.
 9) Sketch of well: Using space at right, show method of plugging the well including all casing and cemented intervals.
 10) Name of Driller or other person actually performing the plugging operations Thomas E. Mathers
 if a water well driller plugged the well, give the driller's license no. 3096 W
 11) Casing and cementing data relative to the plugging operations:



Diameter (inches)	Casing Left in Well	
	From (feet)	To (feet)
4	54	20
Cement Plug(s) Placed in Well		Sack(s) of cement used
From (feet)	To (feet)	
54	0	13.5

D. Validation of Information Included in Form

I hereby certify that this well was plugged by me (or under my supervision) and that all of the statements herein are true and accurate to the best of my knowledge and belief.

Company or Individual's Name Mathers Environmental Drilling
 Address 2333-A Wirtcrest Ln, Houston, TX 77055
 (Street or RFD) (City) (State) (Zip)
 (Signed) Thomas E. Mathers (Signed) _____
 (Person performing plugging operations) (Owner of Well)

For TNRCC use only

WELL NO. _____

LOCATION ON MAP _____

A. Well Identification and Location Data

1) Owner: Sanifill of Texas, Inc Address: West Belt, Houston, TX
(Name) (Street or RFD) (City) (State) (Zip)
 2) Owner's Well Number: MW-3
 3) Location of Well: County Harris 16 miles in West direction from Houston
(N.E., S.W., etc.) (Town)

Legal description:

Driller or other person performing the plugging operations must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

Section No. _____ Block No. _____ Township _____
 Abstract No. _____ Survey Name _____
 Distance and direction from two intersecting section lines or survey lines: _____

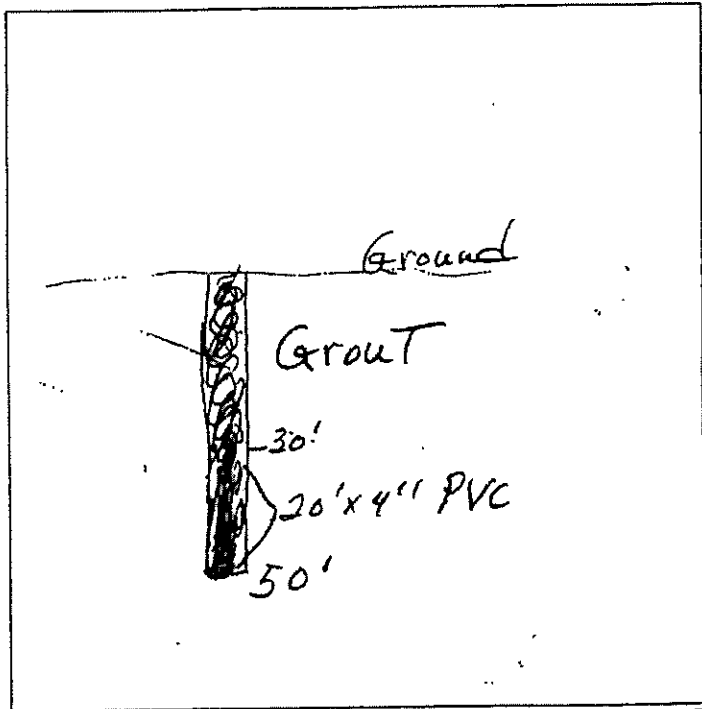
See Attached map.

B. Historical Data on Well To Be Plugged (if available)

4) Driller: N/A License Number: N/A City: N/A
 5) Drilled: N/A 19 N/A Diameter of hole: N/A inches; 7) Total depth of well: 55 feet.

C. Current Plugging Data

8) Date well plugged: 3/11, 19 95.
 9) Sketch of well: Using space at right, show method of plugging the well including all casing and cemented intervals.
 10) Name of Driller or other person actually performing the plugging operations: Thomas E. Mathers
 if a water well driller plugged the well, give the driller's license no.: 3096W
 11) Casing and cementing data relative to the plugging operations:



Diameter (inches)	Casing Left in Well	
	From (feet)	To (feet)
4	30	50
Cement Plug(s) Placed in Well		Sack(s) of cement used
From (feet)	To (feet)	
50	0	12.5

D. Validation of Information Included in Form

I hereby certify that this well was plugged by me (or under my supervision) and that all of the statements herein are true and accurate to the best of my knowledge and belief.

Company or Individual's Name: Mathers Environmental Drilling
 Address: 2333-A Wintcrest Ln Houston, TX 77055
(Street or RFD) (City) (State) (Zip)
 (Signed) Thomas E. Mathers (Signed) _____
(Person performing plugging operations) (Owner of Well)

<small>For TNRCC use only</small>	
WELL NO.	
LOCATION ON MAP	

Please use black ink.
 File WHITE COPY with:
 Texas Natural Resource
 Conservation Commission
 P.O. Box 13067
 Austin, Texas 78711-3067
 Phone (512) 239-0530

State of Texas
PLUGGING REPORT
 (This form must be completed and filed with the TNRCC
 within 30 days following the date the well is plugged as
 required by current statutory law.)

TNRCC
 Water Well Driller
 Advisory Council
 P.O. Box 13067
 Austin, Texas 78711-3067
 Phone (512) 239-0530

A. Well Identification and Location Data

1) Owner Sanifill of Texas Inc Address: West Belt, Houston, TX
 (Name) (Street or RFD) (City) (State) (Zip)
 2) Owner's Well Number MW-4
 3) Location of Well: County Harris 16 miles in West direction from Houston
 (N.E., S.W., etc.) (Town)

Legal description:
 Section No. _____ Block No. _____ Township _____
 Abstract No. _____ Survey Name _____
 Distance and direction from two intersecting section lines or survey lines: _____
 See Attached map.

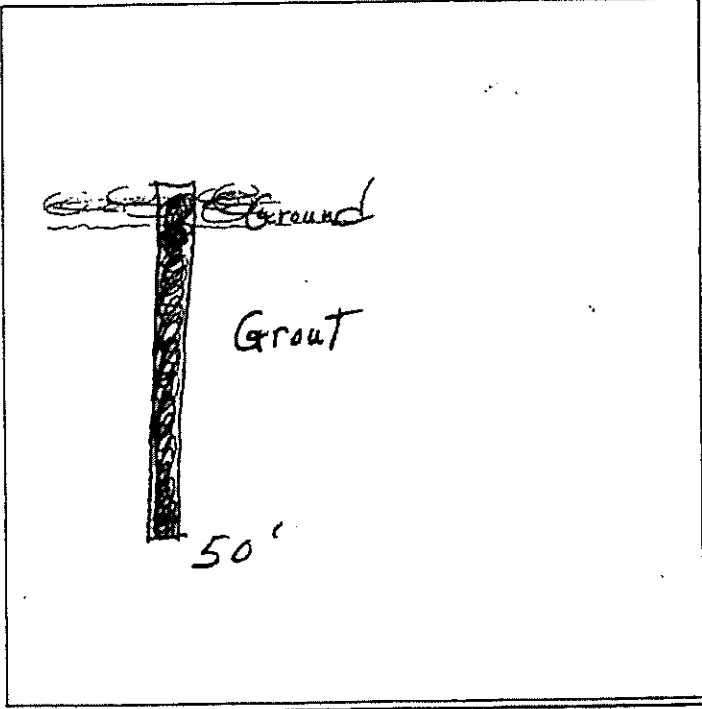
Driller or other person performing the plugging operations must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

B. Historical Data on Well To Be Plugged (if available)

4) Driller N/A License Number N/A City N/A
 5) Drilled N/A 19 N/A Diameter of hole N/A inches; 7) Total depth of well 55 feet.

C. Current Plugging Data

8) Date well plugged 3/11, 19 95.
 9) Sketch of well: Using space at right, show method of plugging the well including all casing and cemented intervals.
 10) Name of Driller or other person actually performing the plugging operations Thomas E. Mathers
 if a water well driller plugged the well, give the driller's license no. 3096 W.
 11) Casing and cementing data relative to the plugging operations:



Diameter (inches)	Casing Left in Well	
	From (feet)	To (feet)
4	0	0
Cement Plug(s) Placed in Well		Sack(s) of cement used
From (feet)	To (feet)	
55	0	13

D. Validation of Information Included in Form

I hereby certify that this well was plugged by me (or under my supervision) and that all of the statements herein are true and accurate to the best of my knowledge and belief.

Company or Individual's Name Mathers Environmental Drilling
 Address 2333-A Wirtcrest Ln. Houston, TX 77053
 (Street or RFD) (City) (State) (Zip)
 (Signed) Thomas E. Mathers (Signed) _____
 (Person performing plugging operations) (Owner of Well)

For TNRCC use only
 WELL NO. _____
 LOCATION ON MAP _____

A. Well Identification and Location Data

1) Owner: Sanifill of Texas, Inc. Address: Tanner Rd Houston, TX
(Name) (Street or RFD) (City) (State) (Zip)

2) Owner's Well Number: MW-1

3) Location of Well: County Harris, 15 miles in West direction from Houston
(N.E., S.W., etc.) (Town)

Legal description:

Driller or other person performing the plugging operations must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

Section No. _____ Block No. _____ Township _____
Abstract No. _____ Survey Name _____
Distance and direction from two intersecting section lines or survey lines: _____

See Attached map.

B. Historical Data on Well To Be Plugged (if available)

4) Driller: N/A License Number: N/A City: N/A
5) Drilled: N/A 19 N/A 6) Diameter of hole: N/A inches; 7) Total depth of well: 50 feet.

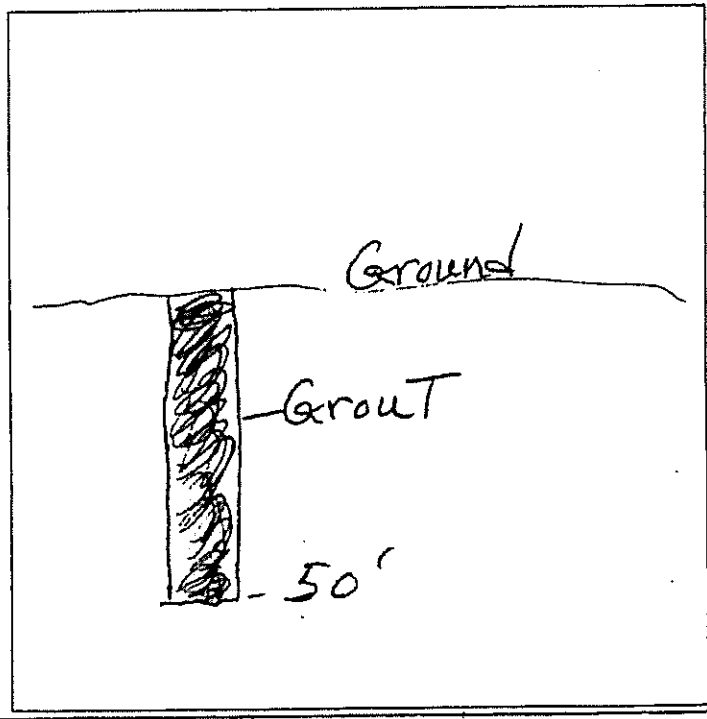
C. Current Plugging Data

8) Date well plugged: 2/13, 19 96.

9) Sketch of well: Using space at right, show method of plugging the well including all casing and cemented intervals.

10) Name of Driller or other person actually performing the plugging operations: Thomas E. Mathers
if a water well driller plugged the well, give the driller's license no.: 3096 W

11) Casing and cementing data relative to the plugging operations:



Diameter (inches)	Casing Left in Well	
	From (feet)	To (feet)
4	0	0
Cement Plug(s) Placed in Well		Sack(s) of cement used
From (feet)	To (feet)	
50	0	12

D. Validation of Information Included in Form

I hereby certify that this well was plugged by me (or under my supervision) and that all of the statements herein are true and accurate to the best of my knowledge and belief.

Company or Individual's Name: Mathers Environmental Drilling
Address: 2333-A Wirtcrest Ln. Houston, TX 77055
(Street or RFD) (City) (State) (Zip)

(Signed) Thomas E. Mathers (Signed) _____
(Person performing plugging operations) (Owner of Well)

For TNRCC use only

WELL NO. _____

LOCATION ON MAP _____

Please use black ink.
 File WHITE COPY with:
 Texas Natural Resource
 Conservation Commission
 P.O. Box 13087
 Austin, Texas 78711-3087
 Phone (512) 239-0530

State of Texas
PLUGGING REPORT
 (This form must be completed and filed with the TNRCC
 within 30 days following the date the well is plugged as
 required by current statutory law.)

TNRCC
 Water Well Drillers
 Advisory Council
 P.O. Box 13087
 Austin, Texas 78711-3087
 Phone (512) 239-0530

A. Well Identification and Location Data

1) Owner: Sanifill of Texas, Inc. Address: Tanner Road Houston, Tx
 (Name) (Street or RFD) (City) (State) (Zip)
 2) Owner's Well Number: MW-2
 3) Location of Well: County Harris 1.5 miles in West direction from HOUSTON
 (N.E., S.W., etc.) (Town)

Legal description:

Driller or other person performing the plugging operations must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

Section No. _____ Block No. _____ Township _____
 Abstract No. _____ Survey Name _____
 Distance and direction from two intersecting section lines or survey lines: _____

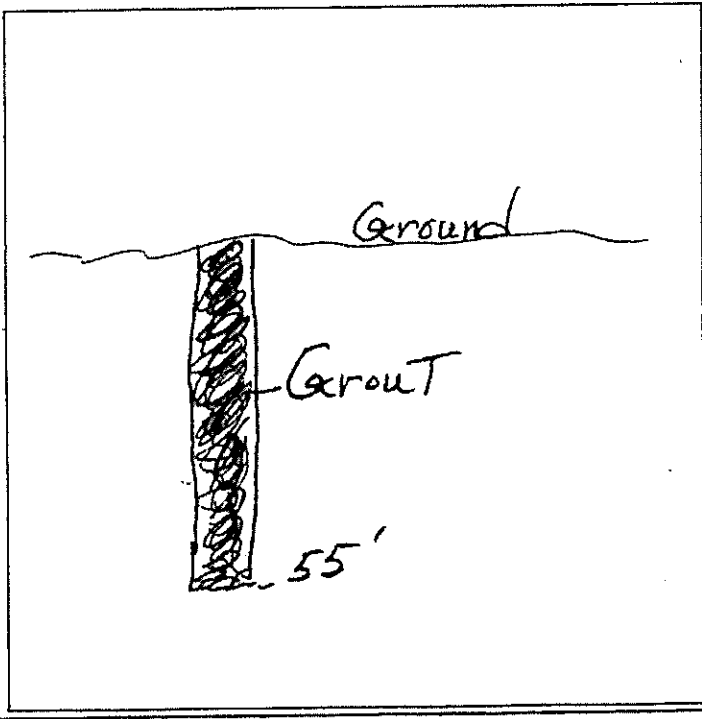
See Attached map.

B. Historical Data on Well To Be Plugged (if available)

4) Driller: N/A License Number: N/A City: N/A
 5) Drilled: N/A 19 N/A 6) Diameter of hole: N/A inches; 7) Total depth of well: 55 feet.

C. Current Plugging Data

8) Date well plugged: 2/13, 19 95
 9) Sketch of well: Using space at right, show method of plugging the well including all casing and cemented intervals.
 10) Name of Driller or other person actually performing the plugging operations: Thomas E. Mathers
 if a water well driller plugged the well, give the driller's license no. 3096 W
 11) Casing and cementing data relative to the plugging operations:



Diameter (inches)	Casing Left in Well	
	From (feet)	To (feet)
4"	0	0
Cement Plug(s) Placed in Well		Sack(s) of cement used
From (feet)	To (feet)	
55	0	11

D. Validation of Information Included in Form

I hereby certify that this well was plugged by me (or under my supervision) and that all of the statements herein are true and accurate to the best of my knowledge and belief.

Company or Individual's Name: Mathers Environmental Drilling (Type or Print)
 Address: 2333-A Wintcrest Ln, Houston, TX 77055
 (Street or RFD) (City) (State) (Zip)
 (Signed) Thomas E. Mathers (Signed) _____ (Owner of Well)
 (Person performing plugging operations)

For TNRCC use only
 WELL NO. _____
 LOCATION ON MAP _____

Please use black ink.
File WHITE COPY with:
Texas Natural Resource
Conservation Commission
P.O. Box 13087
Austin, Texas 78711-3087
Phone (512) 229-0630

State of Texas
PLUGGING REPORT

(This form must be completed and filed with the TNRCC
within 30 days following the date the well is plugged as
required by current statutory law.)

TNRCC
Water Well Drillers
Advisory Council
P.O. Box 13087
Austin, Texas 78711-3087
Phone (512) 229-0630

A. Well Identification and Location Data

- 1) Owner Sanifill of Texas Inc Address Tanner Road Houston, TX
(Name) (Street or RFD) (City) (State) (Zip)
- 2) Owner's Well Number MW-3
- 3) Location of Well: County Harris 15 miles in West direction from Houston
(N.E., S.W., etc.) (Town)

Legal description:

Driller or other person performing the plugging operations must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

Section No. _____ Block No. _____ Township _____
Abstract No. _____ Survey Name _____
Distance and direction from two intersecting section lines or survey lines: _____

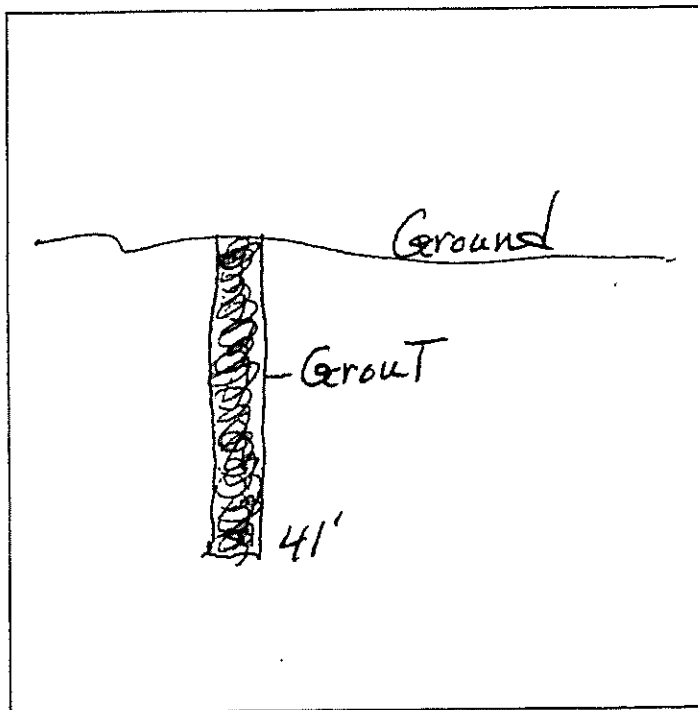
See Attached map.

B. Historical Data on Well To Be Plugged (if available)

- 4) Driller N/A License Number N/A City N/A
- 5) Drilled N/A 19 N/A 6) Diameter of hole N/A inches; 7) Total depth of well 41 feet.

C. Current Plugging Data

- 8) Date well plugged 2/13/95, 19 95.
- 9) Sketch of well: Using space at right, show method of plugging the well including all casing and cemented intervals.
- 10) Name of Driller or other person actually performing the plugging operations Thomas E. Mathers
If a water well driller plugged the well, give the driller's license no. 3096 W
- 11) Casing and cementing data relative to the plugging operations:



Diameter (inches)	Casing Left in Well	
	From (feet)	To (feet)
4	0	0
Cement Plug(s) Placed in Well		Sack(s) of cement used
From (feet)	To (feet)	
41	0	9

D. Validation of Information Included in Form

I hereby certify that this well was plugged by me (or under my supervision) and that all of the statements herein are true and accurate to the best of my knowledge and belief.

Company or Individual's Name Mathers Environmental Drilling
Address 2333 - A Wiertcrest Ln Houston, TX 77053
(Street or RFD) (City) (State) (Zip)

(Signed) Thomas E. Mathers (Signed) _____
(Person performing plugging operations) (Owner of Well)

For TNRCC use only

WELL NO. _____

LOCATION ON MAP _____

PLATE F.7

Please use black ink. File WHITE COPY with: Texas Natural Resource Conservation Commission P.O. Box 13067 Austin, Texas 78711-3067 Phone (512) 239-0530	State of Texas PLUGGING REPORT (This form must be completed and filed with the TNRCC within 30 days following the date the well is plugged as required by current statutory law.)	TNRCC Water Well Drillers Advisory Council P.O. Box 13067 Austin, Texas 78711-3067 Phone (512) 239-0530
---	--	--

A. Well Identification and Location Data

- 1) Owner: Sanifill of Texas Inc Address: Tanner Road, Houston, Tx
(Name) (Street or RFD) (City) (State) (Zip)
- 2) Owner's Well Number: MW-4
- 3) Location of Well: County Harris 15 miles in West direction from Houston
(N.E., S.W., etc.) (Town)

Legal description:

Driller or other person performing the plugging operations must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

Section No. _____ Block No. _____ Township _____
 Abstract No. _____ Survey Name _____
 Distance and direction from two intersecting section lines or survey lines: _____

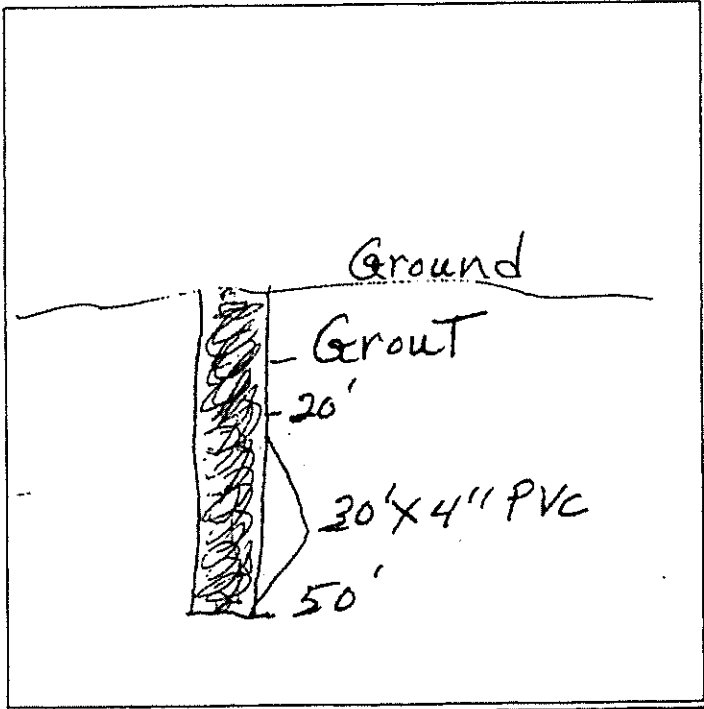
See Attached map.

B. Historical Data on Well To Be Plugged (if available)

- 4) Driller: N/A License Number: N/A City: N/A
 5) Drilled: N/A 19N/A Diameter of hole: N/A inches; 7) Total depth of well: 50 feet.

C. Current Plugging Data

- 8) Date well plugged: 3/10, 1995.
- 9) Sketch of well: Using space at right, show method of plugging the well including all casing and cemented intervals.
- 10) Name of Driller or other person actually performing the plugging operations: Thomas E. Mathers
 if a water well driller plugged the well, give the driller's license no. 3096 W
- 11) Casing and cementing data relative to the plugging operations:



Diameter (inches)	Casing Left in Well	
	From (feet)	To (feet)
4	50	20
Cement Plug(s) Placed in Well		Sack(s) of cement used
From (feet)	To (feet)	
50	0	12

D. Validation of Information Included in Form

I hereby certify that this well was plugged by me (or under my supervision) and that all of the statements herein are true and accurate to the best of my knowledge and belief.

Company or Individual's Name: Mathers Environmental Drilling
(Type or Print)

Address: 2333-A Wintcrest Ln, Houston, Tx 77055
(Street or RFD) (City) (State) (Zip)

(Signed) Thomas E. Mathers (Signed) _____
(Person performing plugging operations) (Owner of Well)

For TNRCC use only
WELL NO.
LOCATION ON MAP

Please use black ink.

File WHITE COPY with:

Texas Natural Resource Conservation Commission
P.O. Box 13067
Austin, Texas 78711-3067
Phone (512) 239-0630

State of Texas

PLUGGING REPORT

(This form must be completed and filed with the TNRC within 30 days following the date the well is plugged as required by current statutory law.)

TNRCC
Water Well Drillers
Advisory Council
P.O. Box 13067
Austin, Texas 78711-3067
Phone (512) 239-0630

A. Well Identification and Location Data

- 1) Owner: Sanifill of Texas, Inc Address: Tanner Road Houston, TX
 (Name) (Street or RFD) (City) (State) (Zip)
- 2) Owner's Well Number: MW-5
- 3) Location of Well: County Harris 15 miles in West direction from Houston
 (N.E., S.W., etc.) (Town)

Legal description:

Section No. _____ Block No. _____ Township _____

Abstract No. _____ Survey Name _____

Distance and direction from two intersecting section lines or survey lines: _____

See Attached map.

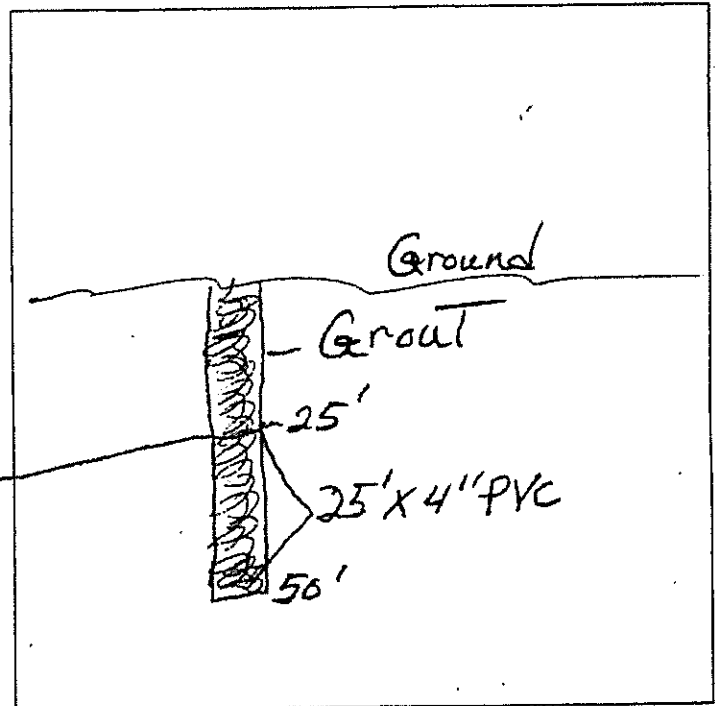
Driller or other person performing the plugging operations must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

B. Historical Data on Well To Be Plugged (if available)

- 4) Driller: N/A License Number: N/A City: N/A
- 5) Drilled: N/A 19 N/A Diameter of hole: N/A inches; 7) Total depth of well: 30 feet.

C. Current Plugging Data

- 8) Date well plugged: 3/10, 19 95.
- 9) Sketch of well: Using space at right, show method of plugging the well including all casing and cemented intervals.
- 10) Name of Driller or other person actually performing the plugging operations: Thomas E. Mathers
 if a water well driller plugged the well, give the driller's license no. 3096 W
- 11) Casing and cementing data relative to the plugging operations:



Diameter (inches)	Casing Left in Well	
	From (feet)	To (feet)
4	50	25
Cement Plug(s) Placed in Well		Sack(s) of cement used
From (feet)	To (feet)	
50	0	12

D. Validation of Information Included in Form

I hereby certify that this well was plugged by me (or under my supervision) and that all of the statements herein are true and accurate to the best of my knowledge and belief.

Company or Individual's Name: Mathers Environmental Drilling
 (Type or Print)

Address: 2333-A Wictcrest Ln Houston TX 77055
 (Street or RFD) (City) (State) (Zip)

(Signed) Thomas E. Mathers (Signed) _____
 (Person performing plugging operations) (Owner of Well)

For TNRC use only

WELL NO. _____

LOCATION ON MAP _____

A. Well Identification and Location Data

1) Owner Sarifill of Texas Address Crawford Houston, Tx
 (Name) (Street or RFD) (City) (State) (Zip)

2) Owner's Well Number _____

3) Location of Well: County Harris miles in W direction from Houston
 (N.E., S.W., etc.) (Town)

Legal description:
 Driller or other person performing the plugging operations must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

Section No. _____ Block No. _____ Township _____
 Abstract No. _____ Survey Name _____
 Distance and direction from two intersecting section lines or survey lines: _____

See Attached map.

B. Historical Data on Well To Be Plugged (if available)

4) Driller N/A License Number N/A City N/A
 5) Drilled N/A 19____; 6) Diameter of hole N/A inches; 7) Total depth of well N/A feet.

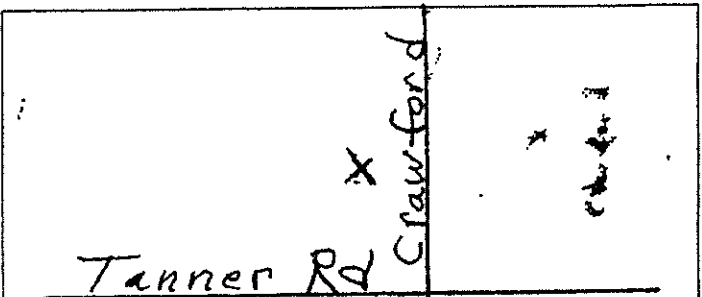
C. Current Plugging Data

8) Date well plugged 2/15, 1995.

9) Sketch of well: Using space at right, show method of plugging the well including all casing and cemented intervals.

10) Name of Driller or other person actually performing the plugging operations Thomas E. Mathers
 if a water well driller plugged the well, give the driller's license no. 3096W

11) Casing and cementing data relative to the plugging operations:



Diameter (inches)	Casing Left in Well	
	From (feet)	To (feet)
5 1/2"	Steel 50'	- 0'
9 5/8"	Steel 50'	- 0'
Cement Plug(s) Placed in Well		Sack(s) of cement used
From (feet)	To (feet)	
50'	0'	6

We Drill The grout out of The existing Abandon oil well To A depth of 50' and remove Casing and grouted back To surface.

D. Validation of Information Included in Form

I hereby certify that this well was plugged by me (or under my supervision) and that all of the statements herein are true and accurate to the best of my knowledge and belief.

Company or Individual's Name T & J Environmental Drilling Services
 Address 2333-B Wirtcrest Ln, Houston, Tx 77055
 (Street or RFD) (City) (State) (Zip)

(Signed) Thomas E. Mathers (Signed) _____
 (Person performing plugging operations) (Owner of Well)

For TNRCC use only

WELL NO. _____

LOCATION ON MAP _____